

THE IRON AGE

A Review of the Hardware, Iron, Machinery and Metal Trades.

Published every Thursday Morning by David Williams Co., 14-16 Park Place, New York.

Vol. 77: No. 6.

New York, Thursday, February 8, 1906.

\$5.00 a Year, including Postage.
Single Copies, 15 Cents.

Reading Matter Contents.....page	537
Alphabetical Index to Advertisers "	177
Classified List of Advertisers ... "	169
Advertising and Subscription Rates "	176

**COMPRESSION
SHAFT
COUPLINGS**
Manufactured by
**FORSTER PULLEY
WORKS,**
Cuba, N. Y.

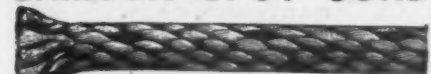


The American Mfg. Co.
Ropes and Twines
65 Wall Street, New York

THE BRISTOL COMPANY,
Waterbury, Conn.
**Bristol's Recording
Instruments.**
For Pressure, Temperature
and Electricity.
Gold Medal, St. Louis Exposition.
All Ranges, Low Prices, and Guar-
anteed. Send for Circulars.



SAMSON SPOT CORD



Also Linen and Italian Hemp
Sash Cord.

SAMSON CORDAGE WORKS, Boston, Mass.

TURNBUCKLES.



Branch Office, 11 Broadway, New York.
Cleveland City Forge and Iron Co., - Cleveland, O.

**DROP
HAMMER**
MERRILL
BROS.
Brooklyn, N. Y.



IRON ORES.

PILLING & CRANE.
Girard Building, Phila.
Farmers' Bank, Pittsb'g.
Empire Bldg, New York.
Board of Trade, Boston.

BETWEEN YOU AND THE ELEMENTS

MF Roofing Tin should be the secret.
Rain and Snow are all right in
their place, but in the house and
leaking through the roof is not their
place. You may depend on MF to
keep them where they belong.

See
**AMERICAN
SHEET & TIN PLATE
COMPANY'S**
Ad. on Page 14.



DEALERS—Remington, Marlin, Stevens, Winchester
and Savage rifles all consume U. M. C. Cartridges. Do your
sales show that you are getting your share of the popular de-
mand? Send to U. M. C. Advertising Department for window
display hangers, literature, etc.

The demand for U. M. C. Cartridges comes from *every
direction.*

**THE UNION METALLIC CARTRIDGE COMPANY,
BRIDGEPORT, CONN.**

AGENCY,
313 Broadway,
New York City.

DEPOT,
86-88 First Street,
San Francisco, Cal.

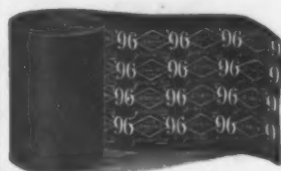
STIRLING CONSOLIDATED BOILER CO. See Page 44

"The Best in the World"

Capewell Horse Nails
DRIVE THE BEST—HOLD THE BEST
THE SAFEST TO USE

MADE BY

The Capewell Horse Nail Company
HARTFORD, CONN.



TIGHT JOINTS can only be maintained
by the use of high grade flange packing.

JENKINS '96 PACKING
is unequalled for *durability*. It is absolutely
guaranteed.

All genuine bears Trade Mark as shown in the cut.
JENKINS BROS., New York, Boston, Philadelphia, Chicago, London.

"Swedoh" Cold Rolled Steel is unex-
celled for **Drawing and Stamping**
THE AMERICAN TUBE & STAMPING COMPANY
(Water and Mail Delivery) BRIDGEPORT, CONN. SEE PAGE 14.



MAGNOLIA METAL.

Best Anti-Friction Metal for all Machinery Bearings.

Fac-Simile of Bar.
Beware of
imitations.

MAGNOLIA METAL CO.,

Owners and Sole Manufacturers,
Chicago, Fisher Bldg.

113-115 Bank Street,
NEW YORK.

San Francisco, Montreal, and Pittsburg.
We manufacture all grades of Babbitt Metals at
competitive prices.

The Queen's Run Fire Brick Co.

HIGHEST GRADE
Shapes a Specialty

Lock Haven, Penn.

We are very busy now-
adays, not only turn-
ing out the Highest
Grades of Tin Plates
and Sheet Steel but
making a large addi-
tion to our mills at the
same time without
stopping.

**WE
CAN'T
HELP
BEING
BUSY**

FOLLANSBEE
Brothers
Company
—PITTSBURGH—

Branches
Louisville
Buffalo

BRASS { SHEET ROD WIRE COPPER { SHEET ROD WIRE GERMAN { SHEET SILVER { ROD WIRE

LOW BRASS. SHEET BRONZE.
SEAMLESS BRASS AND COPPER
TUBING. BRAZED BRASS AND
BRONZE TUBING. : : : : :

WATERBURY BRASS CO., WATERBURY, CONN.

99 John St., New York. Providence, R. I.

Bridgeport Deoxidized Bronze & Metal Co.,

BRIDGEPORT, CONN.

Automobile Castings a Specialty.

High Tensile Strength.

Bronze and Aluminum Alloys.

Write Us.

Matthiessen & Hegeler Zinc Co.,

LA SALLE, ILLINOIS.

SMELTERS OF SPELTER

AND MANUFACTURERS OF

SHEET ZINC AND SULPHURIC ACID.

Special Sizes of Zinc cut to order. Rolled Battery Plates.
Selected Plates for Etchers' and Lithographers' use.
Selected Sheets for Paper and Card Makers' use.
Stove and Washboard Blanks.

ZINCS FOR LECLANCHE BATTERY.

BRASS FOUNDERS FINISHERS J.J. RYAN & CO.

105-109 So. Jefferson St., Chicago.
Best Bronze, Babbitt Metals, Brass and Aluminum CASTINGS
On Short Notice

Brass, Bronze and Aluminum CASTINGS

FOUNDERS-FINISHERS.
W. G. ROWELL CO., Bridgeport, Conn.

HENDRICKS BROTHERS

PROPRIETORS OF THE

Belleville Copper Rolling Mills,

MANUFACTURERS OF

Braziers' Bolt and Sheathing

COPPER, COPPER WIRE AND RIVETS.

Importers and Dealers in

Ingot Copper, Block Tin, Spelter, Lead, Antimony, etc.
49 CLIFF ST., NEW YORK.

THE PLUME & ATWOOD MFG. CO.,

MANUFACTURERS OF

Sheet and Roll Brass

—AND—

WIRE

PRINTERS' BRASS, JEWELERS' METAL, GERMAN
SILVER AND GILDING METAL, COPPER RIVETS
AND BURRS.

Pins, Brass Butt Hinges, Jack Chain, Kero-
sene Burners, Lamps, Lamp
Trimmings, &c.

29 MURRAY ST., NEW YORK.

144 HIGH ST., BOSTON.

199 LAKE ST., CHICAGO.

ROLLING MILL:
THOMASTON, CONN.

FACTORIES:
WATERBURY, CONN.

SCOVILL MFG. CO.

MANUFACTURERS OF

**BRASS,
GERMAN SILVER,**

Sheets, Rolls, Wire Rods,
Bolts and Tubes,
Brass Shells, Cups, Hinges,
Buttons, Lamp Goods.

Special Brass Goods to Order.

FACTORIES:

WATERBURY, CONN.

DEPOTS:

NEW YORK. CHICAGO. BOSTON.

Henry Souther Engineering Co.

HARTFORD, CONN.

Consulting Chemists, Metallurgists
and Analysts

Complete Physical Testing Laboratory; Expert
Testimony in Court and Patent Cases.

Arthur T. Rutter & Co.

**256 Broadway,
NEW YORK.**

Small tubing in Brass, Copper
Steel, Aluminum, German Silver,
&c. Sheet Brass, Copper and Ger-
man Silver. Copper, Brass and
German Silver Wire. Brazed and
Seamless Brass and Copper Tube.
Copper and Brass Rod.

"PHONO-ELECTRIC" WIRE. "IT'S TOUGH."



TROLLEY,
TELEPHONE
and
TELEGRAPH
LINES.

Mills
Bridgeport,
Conn.

BRIDGEPORT BRASS CO.,

Postal Telegraph Bldg.
Broadway and Murray St., New York.

ELECTRIC WELDING

There's no work too difficult for us to do.
Better write and learn what we do and
how well we do it.

THE STANDARD WELDING CO., Cleveland.

Mant's Standard Seamless Tubing.

THE IRON AGE

New York, Thursday, February 8, 1906.

Remarkable Tire Turning.

For some time the New York Central Railroad Company has been giving particular attention to improvements in shop practice at its West Albany shops, and many remarkable records have been made at these shops during the last year or two. One of the most revolutionary improvements has been made in tire turning, especially in turning driving wheel tires. The time taken to turn a pair of drivers in the average locomotive shop is from four to seven hours, or a trifle less than two pairs a day, but in many shops a pair a day is all that is expected from one lathe. At the West Albany shops on

indicated in Fig. 2, allows the full power of the machine to be utilized at the tools. Further, the machine is provided with a full complement of the best grade of air hardening steel tools, including forming tools for the flanges, &c., and about a dozen right and a dozen left hand roughing tools, so that if a tool gives out it can be at once replaced by a new tool. The tools are 3 x 1½ inches in cross section, which is important, as any smaller section will break frequently. And, finally, the machine has good crane service, so that wheels may be quickly put in and taken out of the lathe.

The procedure followed in turning is interesting. In putting the wheels into the lathe the left hand crank

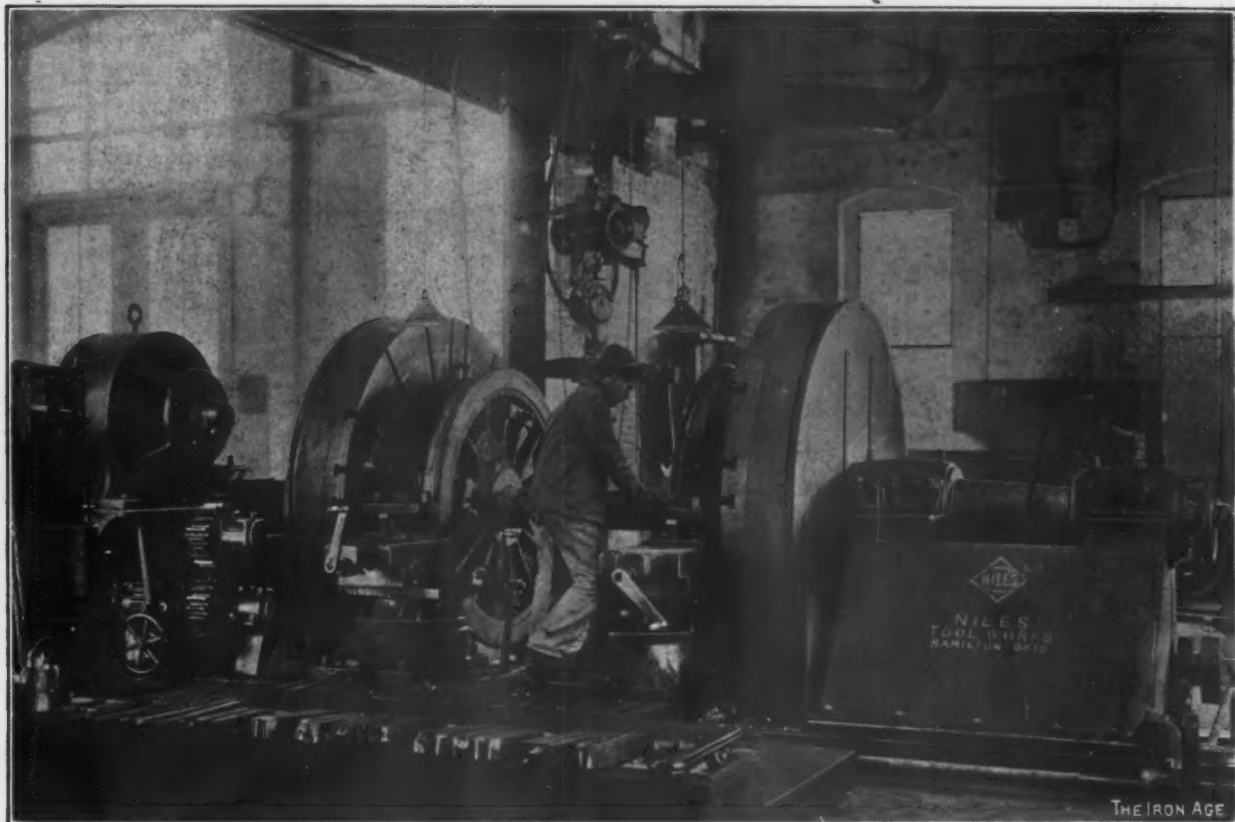


Fig. 1.—The Niles 90-Inch Driving Wheel Lathe on Which the Tests Were Made at the West Albany Shops of the New York Central Railroad Company.

December 19 ten pairs of average tires were turned in nine hours and six minutes, or an average of 54.6 minutes to a pair. Eight of the tires were 64 inches in diameter and two were 79 inches. A complete tabulated account of the tests will be found on the following page. As may be seen from this table the depths of cut were from 5-16 to 9-16 inch, which indicates that a good deal of metal was taken off from each tire. The total weight of metal removed was 2180 pounds. The motor developed as much as 50 to 60 horse-power.

At first thought one may be inclined to doubt the truth of this record, but if the conditions at the West Albany shops are carefully studied they will show that this record, wonderful as it is, can be duplicated in any shop if sufficient attention be given to facilities for tire turning. In the first place, the new Niles driving wheel chucking lathe,* shown in Fig. 1, on which this run was made, is a very different machine from the driving wheel lathe built three or four years ago. It is about twice the weight of the old machine, has four to five times the power, and the means employed for holding the tires,

pin is put in the pocket in the face plate. The movable head is run up by a small motor until the grip pieces are close to the tire. The head is clamped and the wedges are driven up with a light hammer. The clamp bolts are then put on and the nuts screwed up tight with a 3-foot wrench. After starting the cut, if there is any paint or dirt on the tire, the wedges are driven up a little further, a 6-pound hammer being used. The following instructions are followed in turning:

According to the usual method, select the smallest wheel in the set and cut in to the lowest spot. Mark the position of the slide rest, withdraw the tool, move the rest to the outside of the tire and run the tool in to the mark on the slide rest.

Start the cut and caliper, making the other wheel the same size. Using a 5-16 to 7-16 inch feed, run across the tread with whatever speed the tool steel and the hardness of the tire will allow, usually between 10 and 15 feet per minute. The tread will be roughed out in about 11 revolutions. Withdraw the tool to the height of the flange, 1½ inches. (With a four-pitch cross feed screw this would mean 4½ turns of the cross feed handle). Feed

* Described in *The Iron Age*, August 24, 1905.

across the top of the flange (about three revolutions). With the same tool rough down the back of the flange (one revolution) and rough down the front of the flange (one revolution). All this is done at one setting of the tool.

Next apply the scraping tool to the tread of the wheel, smoothing it up in two revolutions, but this oper-

The wheels are now finished and the tool rest is in the right position for the next pair.

The right size for the succeeding wheels of the set is easily obtained by measuring from the inner edge of the tire to the point of the tool. The clamp bolts which hold the tires against the drivers may be loosened during the last revolution of the lathe. The binder bolts of the

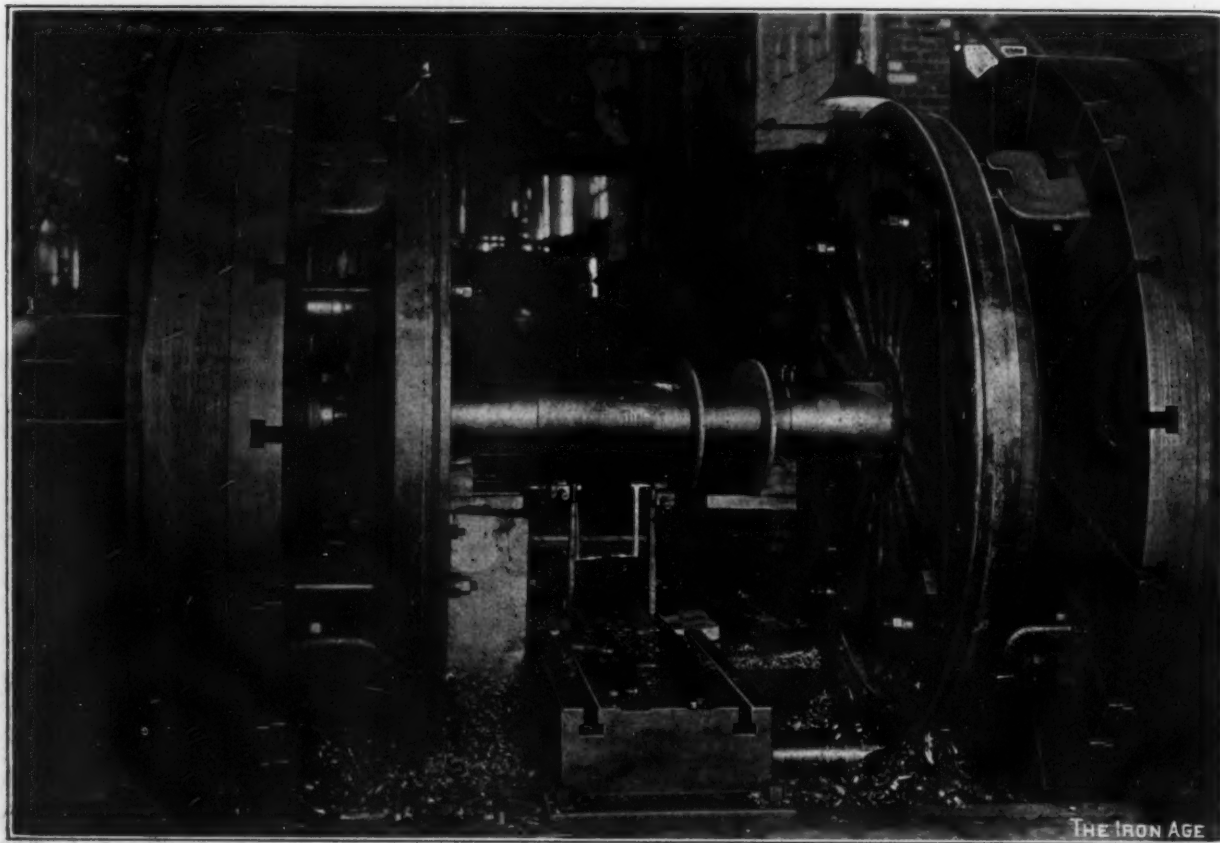


Fig. 2.—A Nearer View of the Lathe from the Rear, Showing the Wheel Chucking Devices.

Test of Niles 90-Inch Driving Wheel Chucking Lathe at West Albany Shops of New York Central & Hudson River Railroad.

Kind of tool.	Diameter of wheel centers. Inches.	Cutting speed. Feet per minute.	Feed per revolution. Inches.	Depth of cut. Inches.	Distance of travel. Inches.	Condition of tool.	Time in minutes.			
							Putting wheels in.	Cutting.	Taking wheels out.	Total.
Midvale	57	12.75	$\frac{15}{32}$	$\frac{7}{16}$	$\frac{15}{32}$	Point burnt off.....	6	45	2	53
Midvale	57	12.75	$\frac{15}{32}$	$\frac{7}{16}$	$\frac{15}{32}$	Point burnt off.....				
Rex-A	57	12.75	$\frac{15}{32}$	$\frac{7}{16}$	$5\frac{1}{8}$	Good				
Rex-A	57	12.75	$\frac{15}{32}$	$\frac{7}{16}$	$5\frac{1}{8}$	Good				
Rex-A	57	12.33	$\frac{15}{32}$	$\frac{7}{16}$	$5\frac{1}{8}$	Good	7	46	2	55
Rex-A	57	12.33	$\frac{15}{32}$	$\frac{7}{16}$	$5\frac{1}{8}$	Point burnt off.....				
Rex-A	57	12.33	$\frac{15}{32}$	$\frac{7}{16}$	$5\frac{1}{8}$	Good				
Rex-A	57	12.33	$\frac{15}{32}$	$\frac{7}{16}$	$5\frac{1}{8}$	Good				
Rex-A	57	12.5	$\frac{15}{32}$	$\frac{9}{16}$	$5\frac{1}{8}$	Good	8	44	2	54
Rex-A	57	12.5	$\frac{15}{32}$	$\frac{9}{16}$	$5\frac{1}{8}$	Good				
Rex-A	57	11.67	$\frac{15}{32}$	$\frac{1}{2}$	$5\frac{1}{8}$	Good	7	43	2	52
Rex-A	57	11.67	$\frac{15}{32}$	$\frac{1}{2}$	$5\frac{1}{8}$	Good				
Rex-A	57	12.25	$\frac{15}{32}$	$\frac{7}{16}$	$3\frac{1}{2}$	Point broken off.....	6	42	2	50
Rex-A	57	12.25	$\frac{15}{32}$	$\frac{7}{16}$	$5\frac{1}{8}$	Good				
Rex-A	57	12.25	$\frac{15}{32}$	$\frac{7}{16}$	$5\frac{1}{8}$	Good				
Rex-A	57	12.25	$\frac{15}{32}$	$\frac{7}{16}$	$5\frac{1}{8}$	Good				
Rex-A	57	10.67	$\frac{15}{32}$	$\frac{1}{2}$	$5\frac{1}{8}$	Good	6	50	2	58
Rex-A	57	10.67	$\frac{15}{32}$	$\frac{1}{2}$	$5\frac{1}{8}$	Good				
Rex-A	57	11.75	$\frac{15}{32}$	$\frac{7}{16}$	$5\frac{1}{8}$	Point broken off.....	6	52	2	60
Rex-A	57	11.75	$\frac{15}{32}$	$\frac{7}{16}$	$5\frac{1}{8}$	Good				
Rex-A	57	8.5	$\frac{15}{32}$	$\frac{1}{2}$	$5\frac{1}{8}$	Point broken off.....				
Rex-A	57	8.5	$\frac{15}{32}$	$\frac{1}{2}$	$5\frac{1}{8}$	Good				
Rex-A	57	11.	$\frac{15}{32}$	$\frac{1}{2}$	$5\frac{1}{8}$	Good	7	47	2	56
Rex-A	57	11.	$\frac{15}{32}$	$\frac{1}{2}$	$5\frac{1}{8}$	Good				
Rex-A	72	14.	$\frac{15}{32}$	$\frac{3}{8}$	$5\frac{1}{8}$	Good	8	46	2	56
Rex-A	72	14.	$\frac{15}{32}$	$\frac{3}{8}$	$5\frac{1}{8}$	Good				
Mushet	72	14.	$\frac{15}{32}$	$\frac{5}{16}$	$5\frac{1}{8}$	Good	7	43	2	52
Mushet	72	14.	$\frac{15}{32}$	$\frac{5}{16}$	$5\frac{1}{8}$	Good				
Totals								458		546

ation can frequently be done in one revolution, if the correct diameter is reached on the roughing cut. The tool rest is now in correct position for finishing the flange, which is done by means of a forming tool. About two revolutions are required for each side of the flange.

Finally, apply the chamfering and beveling tool to the outside of the tread, finishing it in about two revolutions.

movable head are then loosened and the head is run back by the motor, the wheels being supported by the crane. The keys or wedges should next be drawn back so as to be ready to be driven in for the next pair.

In Fig. 3 the roughing and finishing cuts on a wheel rim are shown, with the number of revolutions for each part in the operation as outlined above. Fig. 4 is taken

from a photograph of a part of a wheel after the roughing cut has been made across the tread and Fig. 5 shows a fair sample of the turnings.

On some accounts an individual jib crane for the ma-

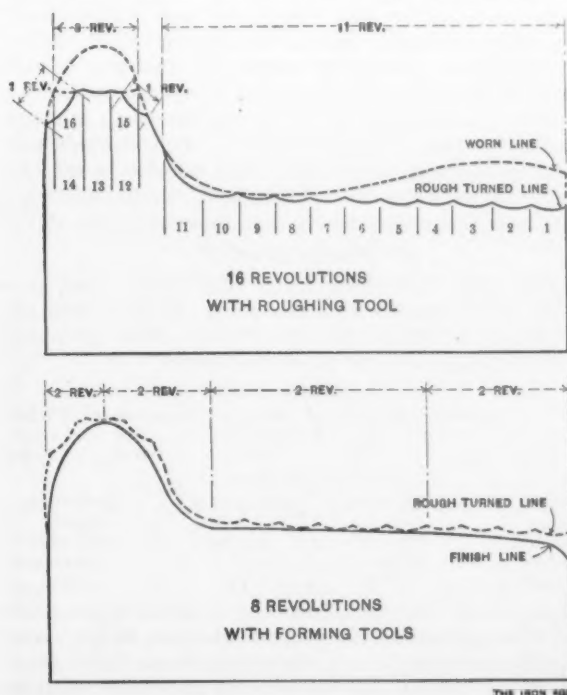


Fig. 3.—Diagram Showing the Number of Revolutions Required for Roughing and Finishing.

chine is desirable, as it is always ready for service and in turning wheels at the rate which is possible with this machine, the services of a crane are required at least every hour.

A fair average time for putting the wheels in the

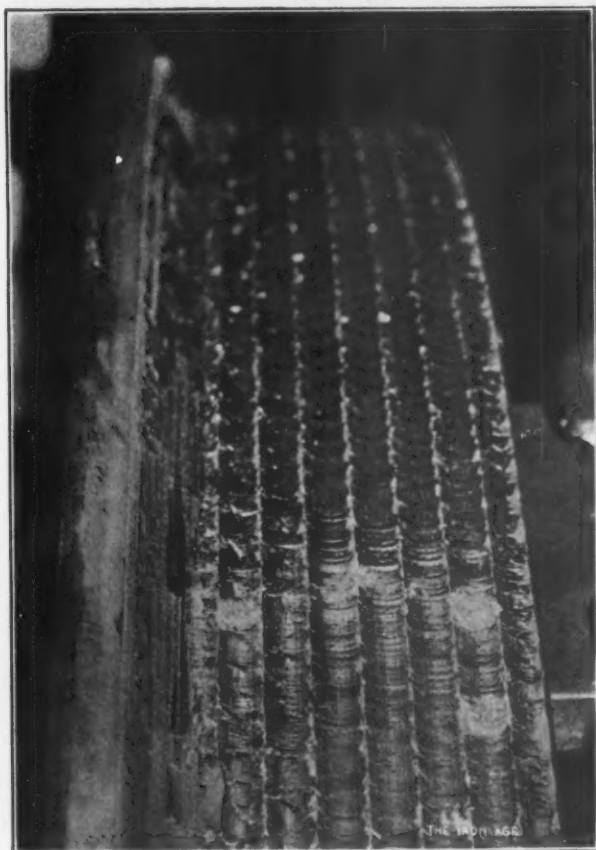


Fig. 4.—A Tire After the Roughing Cut Across the Tread.

lathe and chucking them ready for cutting, with an operator, one helper and one crane man, is 12 minutes, but this has been done frequently in half that time. It takes about three minutes to remove the wheels from

the lathe. With this lathe, properly equipped, the actual turning time should not exceed 45 to 60 minutes, depending on the speed the tool will stand.

The Lawson Cheap Copper Scare.

Thomas W. Lawson's mysterious information, which he has frequently asserted will demoralize the copper market, was made public February 3 in an article published by the *Boston Herald*, in which it is stated that a discovery has been made by Dr. Alexander Shiels, a Glasgow physician and chemist, by which, it is asserted, commercial copper can be manufactured at a cost of 2 cents a pound. Dr. Shiels is said to have discovered a method of disassociating iron ore into certain constituent parts, and, by placing these in conjunction with certain other elements, producing copper.

It is said that Mr. Lawson was attracted to the alleged discovery by an anonymous article printed in a London financial newspaper to the effect that a company, known as "Kosmold, Ltd.," had erected a big plant at Dumbarton, Scotland, for the making of copper by this process. It was stated that among the stockholders were



Fig. 5.—A Sample of the Chips Compared to a 3-Inch Scale.

Lord Kelvin, Lord Overton, Lord Inverclyde and Denny Brothers. All of these, however, have, according to the *Boston Herald*, denied connection with or knowledge of such a company. Lord Kelvin declared that he had no knowledge or belief in the supposed result of the new process. Dr. Shiels declared that the story was a clever concoction of misstatements founded on one or two facts to cause a slump in the stock market. Professor Ramsay, in denying a report that he had passed upon the process, declared he never heard of it.

It is now possible to go by trolley all the way from Rochester to Syracuse, with the exception of a stretch of 15 miles, from Seneca Falls to Auburn. The lines are under the control of three separate companies, which it is proposed to consolidate, with the idea of ultimately making a complete parallel to the lines of the New York Central's Auburn road. The Rochester & Eastern has 44 miles of main line, the Geneva, Waterloo, Seneca Falls & Cayuga Lake Park system has 17½ miles and the Auburn & Syracuse system some 37¼ miles. When the single gap is filled in the companies will have control over about 115 miles of line. The length of the Auburn road is 103 miles. The lines out of Rochester and Auburn are very heavily patronized, without, apparently, making much of an inroad into the local business of the steam road, except for very short runs. With a complete system in operation, much business might be expected to accrue to the lines, including a heavier freight and express service than that now enjoyed.

Nickel Steel and Its Application to Boiler Construction.

BY G. B. WATERHOUSE, NEW YORK.

It is hoped in this short article to survey rapidly the properties of nickel steels that make them specially adaptable as a material for boiler construction. It is impossible in such brief space to do more than mention the very peculiar properties possessed by some of the nickel and iron alloys, such as the loss of magnetism, although both the component metals are magnetic, and the almost complete loss of expansion with increasing temperatures. The subject will be considered under the following heads:

Definition of Nickel Steel.

Boiler Plate.

Flange Steel.

Tubes.

Rivet Steel.

Welding Properties.

Gain in Strength or Saving in Weight.

Noncorrosion.

Finally, a Brief Conclusion and Bibliography.

Definition of Nickel Steel.

Nickel steel may be defined as ordinary steel with its properties modified by the presence of nickel. The proportion of the added element, nickel, is usually from 3 to 3.5 per cent., but in special steels it may rise to as high as 30 per cent. These last mentioned cases are really alloys of iron and nickel, not proper steels, because the carbon is usually very low.

Boiler Plate.

Steels for this use, are most conveniently produced in the open hearth furnace, the process allowing both care in production and the manufacture of the large quantities so often needed. As a consequence the composition is similar to that of usual open hearth material or possibly a little better, because greater care is used with the addition of the nickel. The special high percentage alloys are often made by the crucible process. The properties of ordinary boiler plate are well known, and as nickel steel has been used in this way for some time it is possible to draw a comparison between them. An average of the tests of very many steels of closely related composition and treatment gives the following figures:

Analysis.					
	Carbon.	Silicon.	Manganese.	Sulphur.	Phosphorus.
Per cent....	0.25	0.02	0.58	0.02	0.03
Per cent....	0.24	0.023	0.66	0.021	0.02
Mechanical Tests.					
Elastic limit.	Ultimate stress.	Elongation in 8 inches.	Reduction of area.		
Pounds.	Pounds.	Per cent.	Per cent.		
36,064	64,260	26.6	58.2		
57,344	87,561	23.2	54.4		

From these it may be seen how greatly the tenacity of the steels is raised by the addition of the nickel, while the ductility, as shown by the elongation and reduction of area, is not greatly lowered. An eminent Scotch steel maker, William Beardmore, said in 1896 when speaking before the Institute of Engineers and Shipbuilders of Scotland: "In nickel steel of 0.26 per cent. carbon we have a metal whose elastic limit is equal to the ultimate strength of ordinary carbon steel. It has all the properties of high carbon steel without the dangerous brittleness of the latter."

It is significant to notice the increased ratio of elastic limit to ultimate strength possessed by the nickel steel, which allows a much safer working margin. This is particularly important in consideration of the fact that is being emphasized more and more by the foremost experimental workers in iron and steel—namely, that a steel may be apparently all right but under rapidly alternating stresses, such as a boiler plate is subjected to, may completely fail. At first considerable difficulty was experienced in rolling plates of nickel steel, due to the formation of a tenacious black scale, especially on the under surface, that got worked into the plates, producing ridges. This objectionable feature was only incidental to the in-

troduction of the new material, and with care it was soon found out how to roll the plates properly.

The loss of strength due to the effect of punching is less with nickel steel plates than ordinary ones. After careful investigation Mr. Beardmore says that ordinary mild steel loses 33 per cent. of the original strength, but that the loss in the case of nickel steel varies from only 15.5 to 20 per cent. This is rather a high figure for carbon steels, a good average being 25 per cent., but still nickel brings about a great advantage. It is also said that punching leaves a clean hole, with no slivers or wire edges, and according to Commander J. G. Eaton, nickel steel plates shear more neatly than those of carbon steel.

Flange Steel.

Many tests have been made with flange steel in a similar way to those with boiler plate. An average of the results obtained at the Cleveland rolling mill on specimens cut from plates gave the following figures:

Analysis.					
	Carbon.	Manganese.	Sulphur.	Phosphorus.	Nickel.
Per cent....	0.10	0.27	0.04	0.048	...
Per cent....	0.08	0.36	0.04	0.045	2.7
Mechanical Tests.					
Elastic limit.	Ultimate stress.	Elongation in 8 inches.	Reduction of area.		
Pounds.	Pounds.	Per cent.	Per cent.		
35,240	54,450	27.4	54.0		
47,080	65,760	24.7	52.0		

The addition of the 2.7 per cent. of nickel to this grade of steel has increased the ultimate strength 20 per cent., while the ductility is only slightly lowered. Here again it should be noticed that the ratio of the elastic limit to the ultimate strength has been raised by the addition of nickel. Experiments have been made in flanging nickel steel plates of every thickness suitable for boilers that prove it to be worked without difficulty. It can be readily forged and pressed into dies without cracking, and the large elongation enables it to be worked with great advantage.

Tubes.

The tubes are the part of the boiler that give the most trouble. Lieutenant Parks of the United States Navy said in the discussion on a recent paper that they had tried everything in the navy—charcoal iron, hot drawn steel tubes, cold drawn steel tubes, Bessemer steel tubes and open hearth steel tubes—without finding a material that was satisfactory. The use of an iron nickel alloy with 30 per cent. nickel, provides a material that gives great satisfaction. The French, who have been pioneers in the nickel steel industry, first made high percentage nickel tubes in 1898. They have been adopted in the French Navy, although the complete tests are not given.

Tubes containing about 25 per cent. nickel have been thoroughly tested by Mr. Yarrow, the well-known English ship builder and boiler maker, and his conclusion is that "a boiler would require to be retubed two and one-third times as often with mild steel tubes as it would with nickel steel tubes." He subjected the tubes in his tests to the action of acids, of fire and of superheated steam. The English Navy has treated similar tubes under boiler conditions, and the results are said to be in support of Mr. Yarrow's conclusion.

In 1903 the Shelby Tube Company exhibited samples of these tubes at the Saratoga railroad convention. They were made from 30 per cent. nickel steel manufactured by the Bethlehem Steel Company, and the difficulties had been so far overcome that they were made in nearly the same number of operations as the ordinary seamless tubing. They fulfill the specifications of the Bureau of Steam Engineering of the Navy Department for carbon steel seamless cold drawn marine boiler tubes. The special features of these tubes are their noncorrosiveness, their increased tensile strength and their greater life compared with ordinary steels.

Rivet Steel.

Nickel steel would seem to have a good opening as material for rivets. Some very interesting and important experiments have been made by Maunsel White, whose name is so intimately connected with the introduction of the high speed tool steels. The results showed that nickel steel rivets could be safely worked within perfectly

reasonable limits and with the exercise of only ordinary care. Tests were made with the rivets in comparison with ordinary rivets in both single and double shear, and the heats used were purposely varied from a bright red to almost white.

Mr. White says that it may be safely deduced from the results that a $\frac{3}{4}$ -inch nickel steel rivet would replace a 1 1-16-inch or possibly a $\frac{1}{8}$ -inch common steel rivet, thus effecting a considerable saving of plate section and giving increased strength. Other experiments have shown that nickel steel is much superior in shearing strength to ordinary steel, which lends support to Mr. White's conclusions.

Welding Properties.

The welding properties of nickel steel have been extensively studied. One series of tests was made with a steel containing 3.40 per cent. nickel and 0.31 per cent. carbon, which is higher carbon than boiler material would be. This steel hammered like a hard steel but welded perfectly; and when bent, either hot or cold, twice at right angles at the weld, showed no crack, nor could the weld be seen.

Even with the 30 per cent. nickel tubes welding is possible, and this is evidenced by the fact that many short pieces of this alloy have been welded to ordinary steel tubes, to act as "safe ends" and pass through the flue sheets. Here their elastic limit, which is greater than that of ordinary steels, enables them to stand much better against the expansion of the flue sheets.

It may, however, be taken as a rule that nickel makes the steel harder to weld, the cause being a thin film of oxide that clings to it, of the same nature as the tenacious scale found when rolling the first plates.

Gain in Strength or Saving in Weight.

The facts given in the previous sections show that if the nickel steel is taken of the same thickness as ordinary steel, and used for plates, flanges, rivets, or other purposes the result would be a great increase in strength. The ductility is only lowered a little, the ultimate strength is raised and the elastic limit is also raised, more in proportion than the ultimate strength, thus giving the boiler a higher safe working limit.

If it should be desired to keep the materials of the same strength as carbon steel there comes at once, and without risk, a great saving in weight. In a very interesting paper by A. L. Colby on "Noncorrosive Boiler Tubes," careful calculations with regard to this saving in weight are given. In the case of the torpedo boat destroyer Hopkins there would be a saving of 29 per cent. if its carbon steel tubes were replaced by 30 per cent. nickel steel; and the battle ships Rhode Island and New Jersey would lose 26 per cent. of their total weight of tubes.

The lighter gauge of tubes and thinner plates would also bring about further economy because of the increased steam raising capacity the fuel would have.

Noncorrosion.

The resistance of nickel steel to corrosion has been a very vexed question, some experimenters being sure that it is not much superior to ordinary steel, while others are equally emphatic that it is greatly superior. A great deal was said in the early days of nickel steel about its absolute resistance to corrosion. R. A. Hadfield, the well known metallurgist and discoverer of manganese steel, says in regard to this: "It seemed to be forgotten that the basis of nickel steel was iron and that in the nature of things, unless an extraordinary transformation in molecular structure was obtained, of which there was no proof, the behavior of the basis, iron, while modified in the higher nickel percentages, would much resemble that of mild steel."

Experiments to determine the resistance to corrosion have been carried on in many ways, such as immersing the steel for various periods in fresh water, both cold and boiling, in solutions of different salts, in acids, and by putting plates in sea or river water for long periods of time. Mr. Yarrow's experiments on the boiler tubes of European make, containing about 25 per cent. of nickel, showed that the average loss in weight of plain carbon

steels, when immersed in hydrochloric acid, was 16½ times that of the nickel steel. The oxidizing effect with heat caused a loss in weight of the carbon steel tubes of about 77 per cent., but only about 26 per cent. with the nickel steel.

When the tubes were subjected to the action of superheated steam internally, and to that of an oxidizing flame externally, the carbon steel lost 13 per cent. in weight and became unfit for use, while the nickel steel lost 2 per cent. and was in good condition.

On the whole the results show that the steels with from 3 to 3.5 per cent. nickel are not greatly better than ordinary steels, but that the higher percentage steels are very decidedly superior.

Conclusion.

From the different sections into which this article has been divided, it is hoped that the eminent suitability of nickel steel and high percentage nickel alloys for boiler construction has been made clear. The price of the material is rather a serious matter, because to the cost of ordinary carbon steel is to be added that of the nickel. As has been pointed out, however, less nickel steel may be used to obtain the same strength, and its longer life and superior qualities also atone for its higher price. Again, when the steel, after wear, is only fit for scrap, it may be sold to manufacturers of nickel steel for prices proportional to the nickel it contains.

Bibliography.

D. H. Browne: "Nickel Steel, a Synopsis of Experiment and Opinion." Transactions of the American Institute of Mining Engineers, 1899. Vol. 29, p. 569.

H. A. Wiggin: "Nickel Steel, and Its Special Advantages Over Ordinary Steel." Journal of Iron and Steel Institute, 1895. No. II, p. 164.

F. L. Sperry: "Nickel and Nickel Steel." Transactions of the American Institute of Mining Engineers, 1895. Vol. 25, p. 51.

R. A. Hadfield: "Alloys of Iron and Nickel." Proceedings of the Institute of Civil Engineers, 1899. Vol. 138, pp. 1-124.

A. L. Colby: "Noncorrosive Nickel Steel Boiler Tubes." Society of Naval Architects and Marine Engineers, November 19, 1903.

The Sterling Coal & Coke Company.

This company, for which offices have been secured in the Frick Building, Pittsburgh, has made application for a charter with a capital of \$500,000 and is to own and operate 500 acres of coking coal lands in the Connellsville region in the interest of the Pickands-Magee Coke Company, Pittsburgh. The company is formed by stockholders in the Southern Coal & Coke Company, Mason-town Coal & Coke Company and other companies. It is stated that the property secured is one of the last three pieces of coal property in the Connellsville region that was left on the market. It is near Fayette City and has a river frontage which, with the other coal properties of the same interest, gives a continuous shore line of $4\frac{1}{2}$ miles on the Fayette County side. It will issue \$500,000 in bonds to pay for the land and the owners, the Sterling family, will take these bonds for their property. The stock, which is all subscribed, will be used to develop the property.

The plant is to consist of 300 ovens and a town to be known as Mount Sterling will be built. It is designed to have the plant producing coke during the present year. Its capacity will be about 180,000 tons a year. W. C. Magee is president; George Whyel, vice-president, and I. W. Semans, secretary and treasurer.

A fan and heater designed to handle 3000 cubic feet of air per minute and to heat 2000 cubic feet from 32 to 200 degrees Fahrenheit, have been installed in the Bureau of Engraving and Printing, in Washington. It was stipulated that the heating coils should be so completely insulated with respect to the room as not to transmit heat to it, which requirement seems to have been successfully fulfilled.

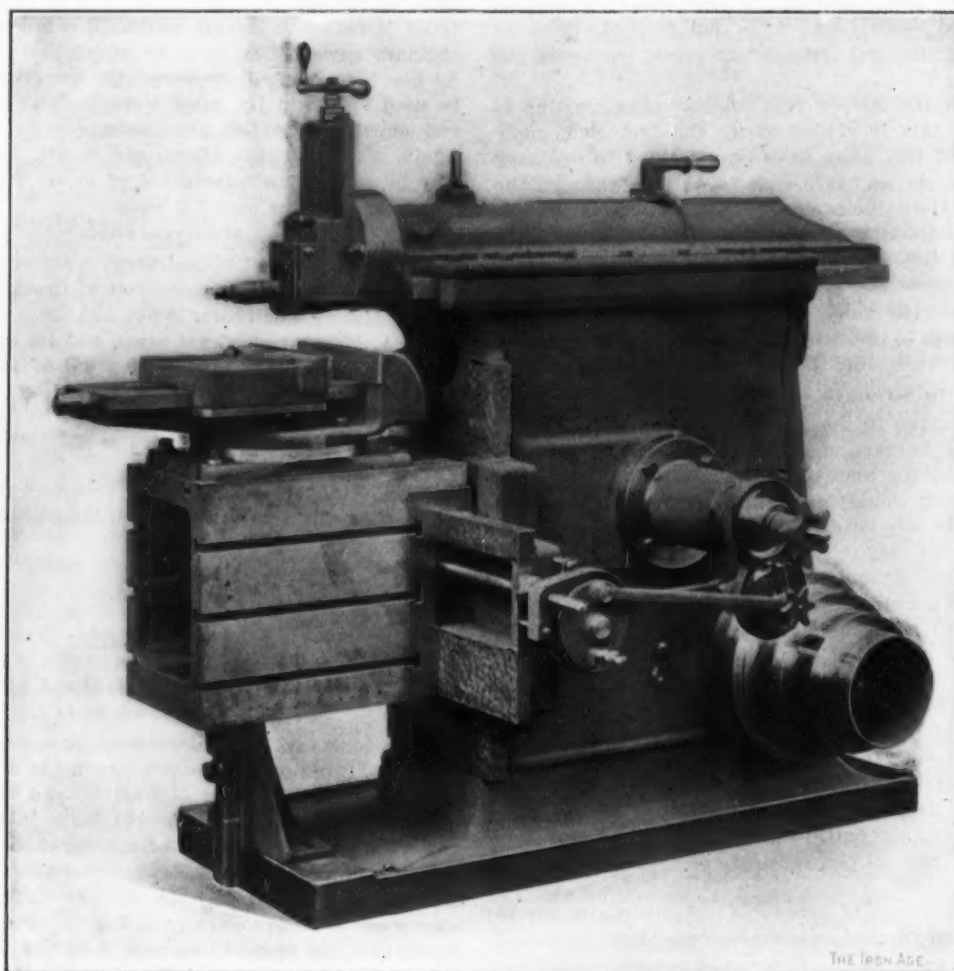
The American Heavy Manufacturing Shaper.

Of all machine tools the shaper has perhaps passed through the most interesting evolution. Originally intended as a tool room machine, it has gradually become an important manufacturing machine and in common with other machine tools has recently felt the changes required by the use of high speed steel tools. The American Tool Works Company, Cincinnati, Ohio, is now building a new line of extra heavy and powerful shapers ranging in size from 16 to 28 inch stroke. The 28-inch back geared crank shaper illustrated is typical of the entire line, the only essential differences being in the dimensions.

The column is deep and wide, tapering slightly toward

almost uniform rate of speed its entire stroke and providing a very quick return. The machine is readily changed from single to back geared running through a convenient lever and has a back gear ratio of 1 to 294, giving it extraordinary power for taking heavy cuts. The maximum length of stroke is 28½ inches.

The rocker arm is bifurcated at the top and with the openings through the column permits a shaft 3½ inches in diameter to be passed under the ram for key seating. Larger shafts may be key seated by setting the table over to allow the shaft to pass outside of the column, using the head set at an angle. The head swivels to an angle of 50 degrees, has an improved locking device and its slide is fitted with a taper gib. The down feed is unusually long, 9 inches, and the feed screw has an adjustable graduated collar reading to 0.001 inch. Its other parts include a large tool post for using holders



The 28-Inch Back Geared Crank Shaper Built by the American Tool Works Company, Cincinnati.

the top. It is strongly braced internally, the braces being disposed so as to effectively withstand heavy working strains. On the outside the column is further reinforced by a wide, deep rib and is extended at the top to the front and rear to provide a long bearing for the ram. The base is large, strongly ribbed and has an extension front with a pad to receive a table support, when the latter is furnished. An oil retaining flange on the base keeps oil drippings from fouling the floor.

The ram is heavy and is designed for uniform rigidity at all points of the stroke. It is braced by internal ribs and has long, wide bearings, with a taper gib for taking up wear. The stroke of the ram is positive and has eight rates of speed, ranging from 15 to 181½ feet per minute with full stroke. The length of stroke may be changed without stopping the machine and the device for positioning the stroke, located near the head, may be operated while the machine is running. A pointer on the ram traveling along an index shows the length of stroke as set. The rocker arm is extra heavy, thoroughly braced and is pivoted near the base line, giving the ram an

with inserted cutters, a tool steel tool post screw and a steel separated back plate.

The table is of box form, with T slots on the top and sides and has internal braces. It is fitted to the apron by an improved method, insuring accuracy and stiffness, and is detachable. The vertical travel of the table is 13¾ inches and the horizontal travel 31 inches. The apron has three T slots on the face, for clamping work when the table is removed. The cross rail is exceptionally long, giving the table a long horizontal travel. It is secured to the column ways by clamps and bolts of improved design, which prevent the cross rail from dropping away when the binder bolts are loose. The telescopic elevating screw is of large diameter and has ball bearings. The elevating gears are of steel, planed from the solid.

The cross feed is variable and automatic, with a range of 0.0114 to 0.25 inch, easily regulated through a simple mechanism. It readily adjusts itself to any height of the rail. Reversing the feed is accomplished by manipulating the knob shown, without stopping the machine.

The vise is of a new and heavier pattern and has deep jaws faced with steel. It is clamped by four bolts to a swivel base graduated in degrees, which is exceptionally large, covering nearly the entire table top and is in turn clamped to the table by four bolts.

The table support is clamped to the base and has a vertically adjustable slide carrying a roller at the top which runs on a planed way on the bottom of the table. In this position the roller has the advantage that it cannot ride over accumulated chips or dirt and thereby affect the accuracy of the work. The table support is furnished extra and is not a part of the regular equipment.

All gears are cut from the solid. The bevel gears are planed and are of coarse pitch and wide face. The pinions in the driving train are cut from bar steel. Easy access is provided to all working parts and convenient and effectual means for constant lubrication are provided. All running bearings are bushed, so as to be easily renewable. The bearing for the driving pulley is massive and is cast integral with column. It is long, extending well into the center of cone, eliminating the necessity of an outboard bearing and is bronze bushed. All shafts are of high carbon crucible steel, accurately ground. The exterior running parts are covered wherever they offer any menace to the operator.

This shaper is claimed to be remarkably smooth in its action, even under the heaviest cuts. In planing work which is afterward to be scraped to a finished surface the accuracy and evenness of the cut are such as to greatly reduce the amount of scraping necessary. The regular equipment includes vise, countershaft and all necessary wrenches. When specified the company furnishes this shaper at extra cost, with power down feed to the head, circular attachment, mold makers' vise, tilting table, table support, four-speed gear box and improved motor drive.

More Pleasure or More Business Automobiles?

BY MARIUS C. KRARUP.

There is a general belief that the "big end" of the automobile industry will eventually be the manufacture of heavy motor trucks and other business vehicles. The Government census of the carriage industry for the year 1900, however, does not quite bear out this belief. Neither is it supported by looking over the returns for the carriage industry in the previous census years, as far back as 1850.

In 1900 the value of family and pleasure carriages turned out reached the sum of \$51,504,176 and their number was 907,482. The number of business, farm, Government and municipal wagons was only 575,351, to which may be added 2316 public conveyances, both classes aggregating an estimated value of \$32,627,787, or about three-fifths of the value of the family and pleasure carriages. Sleights and sleds to the number of 118,222 are not included in these figures. They would add \$2,324,600, mainly to the pleasure end of the production. But, on the other hand, there were also manufactured 23,914 wagons, carts and trucks by agricultural implement makers and a goodly number of similar vehicles by blacksmiths and wheelwrights scattered throughout the country.

The figures above given are not of the highest accuracy, as many manufacturers refused to state their production or rendered unreliable reports, but on the whole the proportions in the figures may be assumed to be approximately correct.

Manifestly it would not be justifiable to infer from these figures that the number of business wagons demanded by this country and in use at any given time is less than two-thirds the number of family and pleasure vehicles (575,351 to 907,482). Assuming that the business wagons last twice as long as the light-built vehicles their number may evidently be the larger one of the two classes, and yet the productive capacity of manufacturers would need to be larger for the smaller class, considering the more rapid deterioration.

No doubt a similar condition will be observed as soon as business motor vehicles shall have become as common as ordinary automobiles. Unless the motor drawn busi-

ness wagon is made to last twice as long as the fancy automobile ordinarily lasts at the present stage of the development, it will scarcely gain the foothold which all who speculate on the future of this branch of the automobile industry assume that it will gain.

The case seems to stand about as follows: The shorter the life of the business motor vehicle shall prove the slower will be its general introduction; and, on the other hand, the longer its life the smaller will be the number required to be manufactured each year to supply the regular demand. Whatever standpoint is taken in regard to the durability of the business motor vehicle in comparison with the durability of the speedier ordinary automobile the statistics of the carriage industry would seem to support the belief that the manufacture of business motor vehicles can never be expected to rise to the magnitude of that branch of the automobile industry which flourishes at present.

Since, however, the production of business motor vehicles is greatly in arrears at present, aggregating perhaps only 1500 wagons total output to date, against about 40,000 pleasure automobiles annually (1905-1906), a period of tremendous activity in the business vehicle field remains one of the attractive industrial possibilities of the next decade, but one which it seems the part of wisdom to frame mentally with the reservation that eventually the annual production of this class of vehicles must be expected to fall below the regular annual production of pleasure vehicles.

The automobile has brought about a good many changes in the whole aspect of pleasure traffic. Persons who never thought of owning a horse and buggy buy a new automobile every year. The business motor vehicle may bring about similar surprises. The analogy from the carriage industry is therefore not absolutely cogent. It has, more especially, one weak point, which should perhaps be considered as favoring the possibilities for a larger eventual production of business motor vehicles than the above cited figures would indicate.

The weak point referred to lies in the fact that the statistics of the carriage industry take no cognizance of the horses required for motive power. If the numbers and values of the horses annually required for the two branches of work—pleasure and business—were included in the statistics it is possible that the business end would tip the scales to its side, since the life of the work horse averages much shorter than that of the animal used for light pleasure work with many intervals of rest. Another factor of even stronger import in the same direction is the presumable fact that the number of horses corresponding to each pleasure vehicle probably does not exceed an average of one, while it probably exceeds two for each working wagon.

Translating these conditions—loosely estimated as they are, for obvious reasons—into motor vehicle analogies, there seems to be reason for believing that the value, if not the number, of business motor vehicles will rise to a greater percentage of the value of pleasure automobiles than that indicated in the corresponding figures from the carriage industry—namely, the proportion between about \$32,000,000 to about \$51,000,000, as noted above. Whatever allowances are made at these points, however, the prediction that the production of business motor vehicles will eventually greatly exceed the production of pleasure automobiles in values and numbers—and such is the prediction now commonly made and accepted—seems to be founded on a somewhat loose guess rather than on the facts and indications of the past.

The options held by Edwin N. Ohl on the stock of the La Belle Iron Works, Steubenville, Ohio, were not exercised before February 1, and in some quarters the belief is expressed that the deal for its sale to new interests may fall through. It is said that the earnings of the company in January were the largest in any one month in its history.

The Westinghouse Air Brake Company has decided to erect a building at Wilmerding, Pa., for the use of the Young Men's Christian Association, to cost about \$50,000.

Refractory Uses of Bauxite.

BY A. J. AUBREY, ST. LOUIS.*

Bauxite is a hydrated oxide of aluminum corresponding to the chemical formula $Al_2O_3 \cdot 2H_2O$, although the proportion of water varies greatly and the aluminum is sometimes replaced by iron. Silica and titanium oxide occur as impurities. Silica varies widely in different deposits. Other oxides of aluminum containing water are diasporite ($Al_2O_3 \cdot H_2O$), and gibbsite ($Al_2O_3 \cdot 3H_2O$). These are found in small quantities, however. The anhydrous oxide of aluminum, known as corundum (Al_2O_3), is found in still smaller quantities than the above, so that bauxite is the only oxide of aluminum found in considerable quantities.

There are three localities in the United States where bauxite has been found in commercial deposits—namely, in Arkansas, New Mexico, and the Georgia-Alabama district. The last named district has probably been worked out by this time and at present the chief sources of the ore are the Arkansas deposits.

Method of Preparation and Manufacture.

The crude bauxite is washed at the mines to remove some of the free silica. It is next calcined at a temperature of 2500 degrees F. (approximately Seger cone 12) and during this process it gives off its chemical water, amounting to about 30 per cent. of the raw ore and also undergoes great shrinkage. It has been observed that the bauxite shrinks very little until after Seger cone 9, approximately 2390 degrees F. is reached, and from Seger cones 9 to 12 the greatest amount of the shrinkage takes place. Accordingly the lowest temperature limit at which bauxite should be calcined is 2500 degrees F.

An analysis of washed calcined bauxite from Arkansas made by the writer is as follows:

	Per cent.
Mechanical water (H_2O)	0.88
Silica (SiO_2)	6.40
Oxide of iron (Fe_2O_3)	1.43
Alumina (Al_2O_3)	87.30
Titanium oxide (TiO_2)	3.99

The calcined material can be bonded with fire clay, sodium silicate or lime and made into brick and tile. As little as 4 per cent. plastic fire clay can be used for a bond for hand made brick. When bonded with lime the bricks become quite hard a few hours after making, so hard that they will not take the impression of the finger nail. This setting or hardening is probably due to the formation of a calcium silicate between the lime and the free silica, analogous to the setting of silica brick when bonded with lime. After a careful drying treatment the bricks are burned in down draft kilns at a high temperature and when burned they are hard and tough and can be thrown to the pavement or batted vigorously against one another without breaking. A brick $9 \times 2\frac{1}{2} \times 4\frac{1}{2}$ inches weighs $7\frac{1}{2}$ pounds and stands a crushing test of 10,000 pounds per square inch.

The problem of calcining the washed granular bauxite presents itself. It cannot be successfully calcined in a vertical shaft kiln because it will pack and clog on account of its fineness and so obstruct the passage of the kiln gases. On the other hand, it is not feasible to calcine it in the ordinary down draft kiln on account of the perforated floor. The writer believes that to calcine it on a commercial scale would require a rotary kiln using oil, gas or powdered coal for fuel, preferably the former. Provided the cost of fuel is low at the mines, these kilns should be installed there in order to save the cost of transportation which is now paid on the 30 per cent. of water that the crude bauxite contains.

Brick for Open Hearth Use.

For basic open hearth steel furnaces a brick high in alumina and low in silica is required. A brick of this character is obtained in the following way: A pure white variety of the pisolitic bauxite, which has already been washed at the mines and a portion of its free silica removed, is selected and sieved. All the fine material passing through the sieve is rejected, as it contains the

greater part of the silica. The pisolites or pebbles about the size of peas are retained, as they are higher in alumina and freer from silica than any other part of the bauxite. Now by using lime selected for its freedom from silica, as a bond, a brick can be procured which will contain as low as 6 or 8 per cent. silica.

A high silica content has always been the chief objectionable feature of bauxite brick for basic open hearth steel furnaces, because the silica is attacked by the basic slag. Authorities on open hearth practice have generally declared that bauxite brick would be suitable for basic open hearth furnaces provided a brick could be made with less than 12 per cent. silica content. And indeed recent tests made along this line seem to bear out this statement.

Results of Tests in the Open Hearth.

A test was made several months ago in one of the basic open hearth furnaces of the Bethlehem Steel Works in which a bauxite and a magnesite brick were placed side by side near the gas and air ports, and submitted to the highest temperature attainable in the furnace. The magnesite brick bent and showed viscosity after a period of seven minutes, against a period of 15 minutes for the bauxite brick. Again, a magnesite brick and a bauxite brick were bathed in the slag near the doors for some time, after which they were withdrawn and examined when cold. The magnesite brick was incorporated with slag, while the bauxite when broken open showed that the slag had not penetrated to its center, but had remained as a coating over the outside. Both bricks were quite badly affected, but it was readily apparent that the bauxite withstood the action of the corrosive slag equally as well as the magnesite.

More recent tests with brick having a lower content of silica have shown results as favorable as the magnesite when exposed to the action of the basic slag. The comparison is hard to make in any case because of the fact that either a bauxite or a magnesite brick, if left in the hearth of the furnace for any length of time and submerged in the slag, is so violently attacked that the differences in the portions that are taken out are not easily detected. Even a magnesite brick, if thrown into a basic open hearth furnace, will be entirely eaten away after a considerable length of time, so that the real test of bauxite brick will be to build a hearth or portion of hearth out of such bricks and test them, covering them with calcined bauxite and treating them in every way like the magnesite hearths are treated. Some steps are now being taken toward accomplishing tests of this character.

Bauxite Long Known to Be Refractory.

Sir William Siemens found that bauxite was a superior furnace lining, and even though he used an inferior bauxite containing as much as 35 per cent. oxide of iron, he claimed that they lasted five or six times as long as Stourbridge "first brick." Siemens also says of bauxite: "It is important to observe that bauxite when exposed to intense heat is converted into a solid mass of emery of such extreme hardness that it can hardly be touched by steel tools and is capable of resisting mechanical as well as the calorific and chemical action to which it is exposed."

Bischof, in his "Fuerfesten Thone," says that bauxite, "when not impure on account of the admixture of foreign substances, especially of iron, which generally occurs in considerable quantities in compounds of aluminum, is extremely refractory." He also goes on to say that "the addition of varieties free from iron, or the white ones, to other refractory clays offers the only important means known of increasing their percentage of alumina and at the same time their refractoriness."

It appears then that bauxite has been regarded as a refractory material for a long time, but that no definite use has been made of it; also that the inferior grades have been more generally tested than the purer ones.

Other than its use for open hearth furnaces, which, by the way, is being thoroughly exploited and investigated to make certain of its fitness before taking any risks, bauxite brick has shown up quite successfully in other lines. Two recent applications are its use as a lining for

* Chemist of the Laclede Fire Brick Mfg. Company.

rotary Portland cement kilns and for lead refining furnaces.

Lining Rotary Portland Cement Kilns.

As a lining for a rotary Portland cement kiln it has shown unusual durability and has given excellent service. As an experiment the hot zone (about 10 to 12 feet) of a 60-foot rotary kiln fired with coal dust, was lined with a 6-inch bauxite lining, whereas the kiln had previously been lined with a 9-inch fire brick block.

A block for lining rotary Portland cement kilns in the hot zone must possess the following qualities: It must be neither too hard nor too soft, for if too hard it will not allow the cement coating to stick to its surface, and if too soft it will not hold the coating, but the latter will pull off, bringing portions of the brick with it. The cement coating affords an excellent protection for the lining, and if the bricks used do not hold this coating they soon burn out. The bauxite block made for this purpose has all of the aforesaid qualities.

After ten months' continuous service night and day this 6-inch lining is still doing work. The loss of output in cement for every 24 hours that one of these rotary kilns is shut down is equivalent to the sum of \$250. As the minimum time required for lining or patching a kiln in the hot zone is from 36 to 48 hours, one can easily estimate that the loss of output will be equivalent to a sum varying between \$375 and \$500. In this case it is quite apparent that a superior lining will be the cheaper in the long run. Again, it must be remembered that only the hot zone need be lined with a bauxite block.

Lining Lead Refining Furnaces.

The second and most recent application of bauxite brick has been that of lining portions of lead refining furnaces. Pig lead containing copper, antimony and occasionally arsenic and other metals in small quantities is charged into the hearth of a reverberatory furnace, whose hearth is 10 x 13 feet, lined on the bottom by 9-inch square bricks set on end. The sides of the furnace are lined with a single course of 9-inch bricks laid with ends against the walls. The temperature of the furnace is from 1300 to 1400 degrees F., and outside of the part it plays in melting the fluxes bears no relation to the destruction of the bricks, as they are sufficiently refractory to withstand much higher temperatures. It is purely a case of chemical action on the bricks.

During the process of refining a scum rises to the surface of the molten lead, and this scum contains most of the impurities which the refining is designed to remove. It consists largely of litharge or yellow oxide of lead, copper oxide and antimony oxide, with possibly other oxides in much smaller amounts.

Wherever the bricks are exposed to this scum, particularly around the doors, where there is a larger supply of oxygen and accordingly litharge is more easily formed and along the level of this scum, they are badly eaten away and have to be taken out after several weeks' service and generally have to be patched after a week has passed. Consequently the furnace loses much time for repairs, which lowers its output considerably.

The cutting away of the bricks is explained as follows: Multiple silicates are formed between the oxides of the metals in the scum and the silicates of alumina and free silica in the brick, and these are very fusible, because lead oxide, which is one of the most fusible of the oxides, comprises the greater part of the base or RO element of the silicate. But there are also several other oxides in the base of the silicate, and it is quite well understood that multiple are more fusible than single silicates.

Hence as very fusible silicates are formed between the scum and the fire brick the bricks are very rapidly decomposed and eaten away. It was observed that a porous brick wore out faster than a dense brick; also that the scum penetrated along the joints for several inches beyond the exposed face of the brick. This is probably due to the fact that the raw fire clay which was used in making the joints is much more soluble in the scum than the burnt clay. Accordingly, great care should be taken in laying the brick to see that the joints are as tight as possible.

Whereas the scum is composed of highly basic oxides

it was considered reasonable to supplement a basic lining for the fire brick lining, and accordingly a lining of bauxite was put in wherever the bricks were exposed to the slag. The result was that bauxite bricks lasted from five to six times as long as the fire brick lining.

With its above mentioned uses and its possible advent into open hearth practice and elsewhere the writer feels that bauxite brick will comprise one of our most valuable and useful refractory materials.

Customs Affairs.

The Administrative Act.

The Board of United States General Appraisers has held several sessions to consider the recommendations concerning changes in the customs administrative act made by the Merchants' Association of New York in a report submitted to the Secretary of the Treasury. One of the principal changes urged by the association has to do with the assessing of duty on the cost price of foreign merchandise rather than on the basis of the actual foreign market value at the time of exportation. Marion De Vries, president of the board, said that the customs tribunal would forward a report to Secretary Shaw dealing with the various features of the association's report. The president declined to say whether the board will indorse the recommendations of the association. A prominent member of the customs court states to a representative of *The Iron Age* that he is convinced that there will be no modification of the customs regulations during the life of the present Congress. In the opinion of this general appraiser, who is not affiliated with the party now in power at Washington, there would be no end to the tariff tinkering were the doors opened for a few reforms. While convinced that the present administrative act frequently works hardships on honest importers, the official referred to believes that a revision of the act at this time would upset customs procedure and result in endless confusion. Other officials connected with the board and the Treasury Department have given it as their belief that there will be no alteration of the existing administrative laws at this time.

Steel Gas Cylinders.

An interesting customs controversy has arisen over the classification of steel cylinders for holding gas under pressure. It had been generally supposed that former litigation had settled the question of the assessment to be levied on merchandise of this kind, but recent action by the collector at New York has revived the issue. Most of the cylinders, it is said, are used on railroad cars for supplying the necessary gas for lighting purposes. It appears, however, that the Liquid Carbonic Company, New York, recently imported 400 of the empty steel cylinders, which the collector returned for duty as manufactures of metal, at the rate of 45 per cent. This classification being 10 per cent. higher than the rate under which similar cylinders have been admitted, the importers objected and have taken their case before the Board of United States General Appraisers, which has been asked to pass upon the correctness of the collector's return. Tubes larger than those imported by the Carbonic Company have in the past been admitted at lower duty. The use of such tubes was the same as those now under protest and the present protestants see no reason for paying a higher duty on similar merchandise.

The Board of Appraisers has designated February 20 as the date for a hearing on the questions involved. It is known that no efforts will be spared by the importers to convince the customs court that the Treasury officials have erred in returning the cylinders for duty at 45 per cent. Just what defense will be followed by the Government is not apparent. The indications are that if the importers are defeated in the lower tribunal an appeal will be made to the Federal courts to review the matter. It is known that the Safety Car Heating & Lighting Company and the Pintsch Compressing Company have grievances similar to that of the Liquid Carbonic Company. The test litigation about to be inaugurated will be followed with much interest by the handlers and users of the gas cylinders.

The New York Rubbish Incinerating Plant.

Utilized in Lighting the Williamsburgh Bridge.

BY S. D. V. BURR.

The new electric light plant installed by the City of New York at the foot of Delancey street is now furnishing all the current required by the Williamsburgh Bridge, which spans the East River. The plant is under the joint control of the Bridge and Street Cleaning Departments. The former deals with the power and generating division and the latter with the incinerators, for which it furnishes the fuel.

Before attempting any description of the outfit one fact should be clearly borne in mind. The furnaces are supplied with rubbish. In the technical meaning of the Street Cleaning Department this refers to clean material and at this time should not be confounded with refuse or garbage. It is mostly composed of waste paper, boxes,

installation, the cost of up-keep and the wages of the engineers necessary for the care of the generating plant and boilers.

A portion of the rubbish delivered to the station is worth too much to be burned—it has a direct money value and there is always a market for it. The carts bring the stuff in one confused mess. All bottles, bits of metal, rags and certain grades of paper are carefully removed and disposed of by a contractor who, in return for the privilege, furnishes all the help required in the boiler room, such as stokers, cleaners, &c.

General Plan of Station.

The station comprises two detached brick buildings, located at the foot of Delancey street under the Manhat-

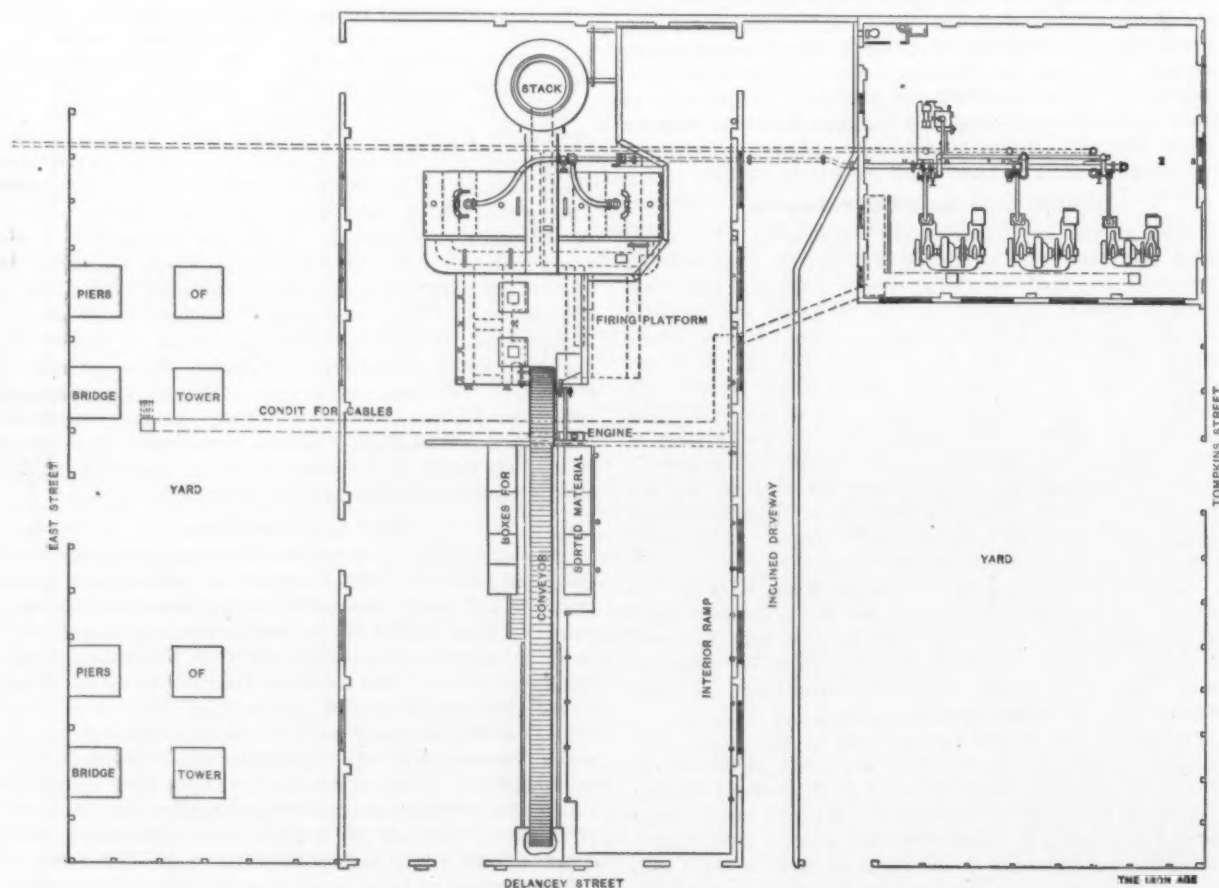


Fig. 1.—Plan of the New York Rubbish Incinerating Plant.

discarded furniture and the like. Garbage or kitchen refuse is never delivered to this station. The principal ingredient, perhaps as high as 90 per cent. of the whole, is waste paper, handled loose or tied in bundles—any way that the collectors find it.

A special division of the Street Cleaning Department is assigned to this work, and special receptacles are provided in order to keep it separate from other material to be carried away. At the station it is thrown into the incinerator just as received, without treatment of any description. It is rubbish that must be removed by the department and that is useful only as a fuel when consumed in a furnace of special design. The station is, therefore, under no outlay for fuel and, as will be more fully explained further on, under no outlay for handling this fuel. With these two items of running expense removed it becomes apparent that the current is produced at very small cost, as compared with stations using coal handled by paid stokers. The actual expense borne by the two departments is the interest on the cost of the

tan span of the Williamsburgh Bridge. The larger contains the rubbish handling machinery and the boilers and their incinerators; the smaller contains the engines, condensers, generators, storage batteries, switchboard, &c.

There are two Stirling boilers of 200 horse-power each, one having 74 square feet of grate surface and the other 113 square feet. Each has 2000 square feet of effective heating surface. Each boiler is provided with an incinerator arranged to consume the rubbish. Provision is made for firing either boiler with coal, in the usual way, if its incinerator should become disabled, or if it should be impossible to deliver the rubbish for a time. Generally speaking, the boilers are set in the usual way, the incinerating furnaces merely serving as an addition to the unit. There is no change in the construction; the gases of combustion pass from the incinerator through the boiler furnace and tubes to the stack. The grates burn from 30 to 40 pounds of rubbish per hour per square foot of surface and the evaporation from and at 212 degrees is 1½ pounds of water per pound of fuel.

The Stack.

The stack is built with a spirally laid fire brick lining, having a pitch of about 16 feet. This insures a tight lining free from openings through it into the surrounding air space and obviates the troubles arising from the common off-set sectional construction. In the latter method of building the lining is divided into sections or lengths, each of which is supported independently upon corbels from the walls of the stack. The lining is

minings and facing of buff brick. The rubbish may be delivered in either of three ways: through the front of the building, Fig. 1; through the yard and side door at the left, or up the outside inclined driveway on the right side of the building. In the first two cases the material is dumped on the ground floor level and from there elevated to the firing platform on top of the incinerators. In the other case the carts drive up the incline along the west wall, enter the building at the rear, deposit their

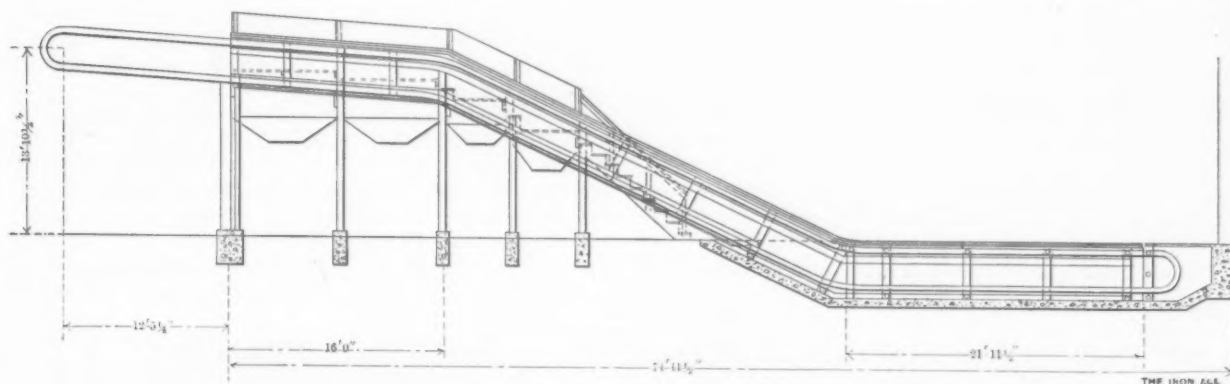


Fig. 2.—Side Elevation of the Belt Conveyor.

thus composed of separate sections, each of which is free to expand and contract without reference to the others; the result being the formation of openings into the air space at each off-set. The spiral form of construction overcomes this, since the lining expands and contracts as an integral mass. The stack is $4\frac{1}{2}$ feet in diameter inside at the top by 200 feet high, and was erected by M. W. Kellogg & Co.

To afford protection against lightning, two lengths of $\frac{3}{4}$ -inch galvanized wrought pipe are secured to the top

loads on the firing platform and drive down the ramp on the inside and out at the front.

Inclined Belt Conveyor.

Occupying the center of the building and extending from the front wall to the top of the firing platform is an endless inclined belt conveyor, 178 feet long by 4 feet wide, built by the Jeffrey Mfg. Company. The apron is made up of flights of steel, No. 12 gauge, double headed, each 6 inches long by 4 feet wide. Each flight has a side guard 6 inches high, so shaped at the ends as to permit



Fig. 3.—Picking Salable Material from the Rubbish as It Is Carried Along by the Conveyor.

of the chimney by galvanized braces built into the masonry. Each pipe is capped with a point of retort carbon about 5 inches long and 1 inch in diameter, set into a brass sleeve screwed on the pipe. A $\frac{1}{2}$ -inch stranded copper cable connects the two points, passes down the side of the chimney and ends in a coil in the earth.

Arrangement of Boiler House.

The boiler house is 170 feet deep, with a 50-foot face on Delancey street. It is of brick, with terra cotta trim-

turning at the sprocket wheels without leaving an opening between. The flights are carried on two strands of malleable iron roller chain. The rollers run on steel angle rails secured to the supporting frames. The conveyor is driven by a small steam engine placed at the top of the incline, the speed of the belt under full load being 70 feet per minute.

Beginning at the north or front wall, the conveyor is at the floor level for a distance of 22 feet. It then rises $13\frac{1}{2}$ feet, the inclined portion being 30 feet 4 inches long.

The top travel is $28\frac{1}{2}$ feet, making the total horizontal length 87 feet. The construction of the conveyor and its supporting frames is plainly shown in the side elevation, Fig. 2.

Upon each side of the inclined portion are steps leading to sorting boxes ready to receive the material picked from the rubbish carried up by the conveyor. This work

brick lining is laid up independent of the red brick outer walls, so as to leave an air space between. The tops of the cells and flues are made of arch fire brick and the space between the side walls and arches is filled with clean ashes. On the stoking side of the furnace are cast iron fronts that carry the guides for the doors. The doors are arranged to lift vertically in grooves and are balanced by cast iron weights hung on chains passing over grooved pulleys. The flue dampers are made of fire tile banded with iron and work in grooves built in the

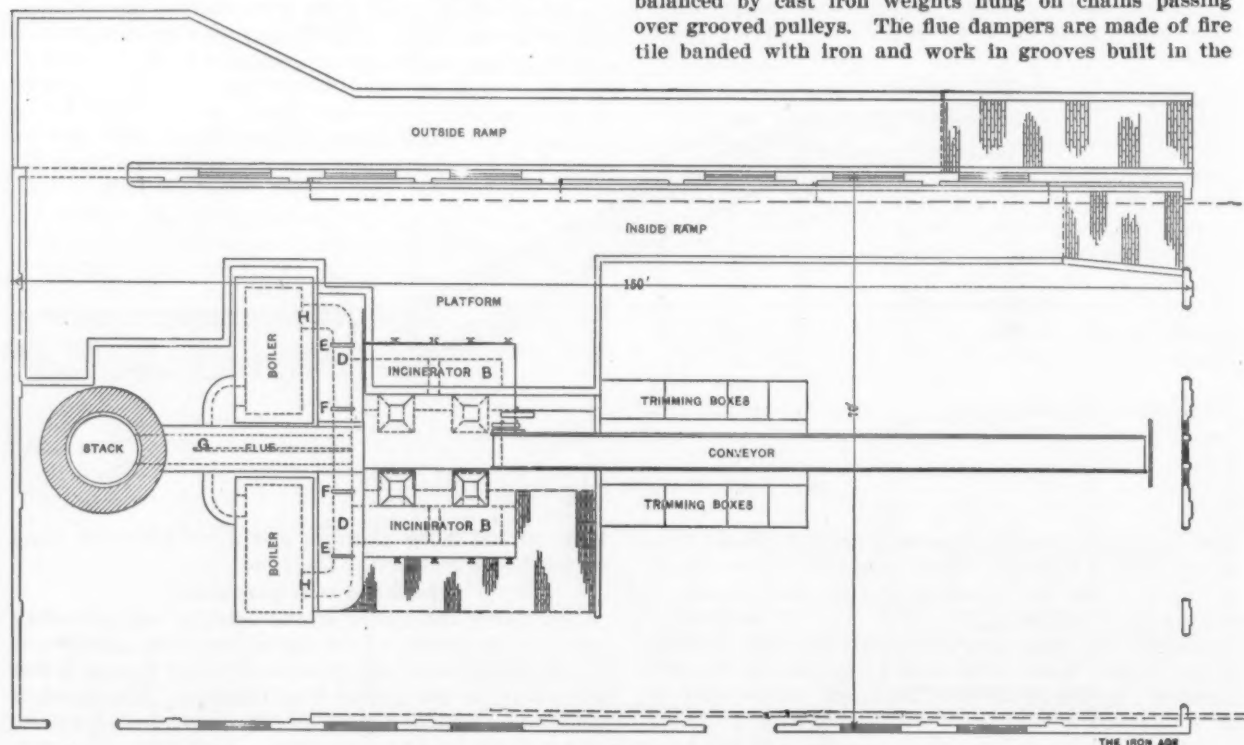


Fig. 4.—Plan of the Incinerators, Boilers and Stack.

is done by men placed at each side of the belt, as shown in Fig. 3. At the right in this engraving is one of the street cleaning carts, behind which is the ramp leading down from the charging floor.

The unmarketable material is deposited on the platform at the top of the conveyor, which is built directly over the two incinerators, one for each boiler, and, in fact, forms their roof. It is then pushed into the openings leading to the furnace. Material too bulky to be handled

masonry. They are lifted by means of chains and differential pulleys carried on pipe supports.

The grates are of wrought iron bars 5 inches deep and beveled to a taper of $\frac{1}{2}$ inch at the top and 3-16 inch at the bottom. They are $4\frac{1}{2}$ feet long and every three bars are riveted together at the ends and center through spacing pieces cut from the bars and inserted in an inverted position.

The two furnaces vary somewhat in construction, as

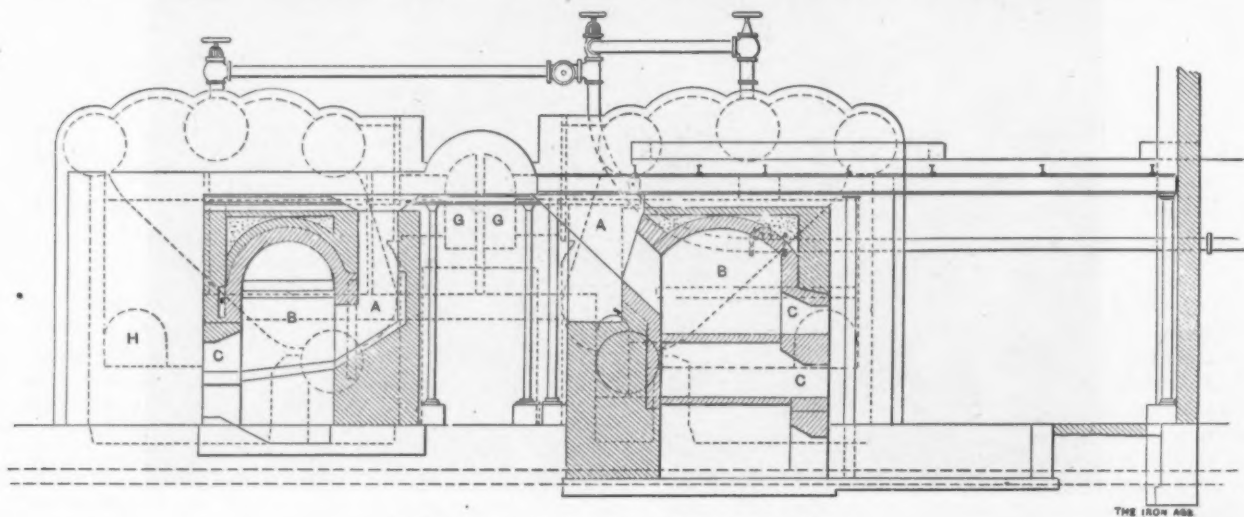


Fig. 5.—Cross Section through the Incinerators.

in this way, such as old furniture and the like, is fed to the furnace through a large door at the rear.

Rubbish Incinerator.

The position of the incinerators and their relation to the boilers and stack are shown in the plan view, Fig. 4, and a cross section through both incinerators in Fig. 5. Like reference letters refer to the same parts.

The incinerator is a fire brick arched chamber 13 feet long by 4 feet 7 inches wide and 6 feet high. The fire

shown in Fig. 5. The left hand one has one set of slightly inclined grate bars and one row of stoking doors, while the other, designed by F. L. Stearns of the Street Cleaning Department, has two horizontally disposed grates and two rows of stoking doors. The dimensions are also slightly different, but in general arrangement and in the flue passages the two designs are similar.

The rubbish is pushed through the feed hole A, Fig. 5, into the combustion chamber B. The feed passages are

inclined so as to throw the fuel directly on the grates, on a level with which are the stoking openings C. From the furnace the gases may be directed through either of two flues to the centrally located stack. The furnace delivers into the chambers D, Fig. 4, the ends of each of which are provided with fire tile flue dampers, E and F. These move in vertical grooves in the sides of the flue and are lifted through slots in the roof of the flue when it is desired to open the passage. Closing the damper E and opening F makes direct connection with the stack through the flue G. This is a double flue divided into passages for each furnace by a central fire brick partition. When the damper F is closed and E opened the gases pass into the flue H and through the boiler tubes, in the same way as would the gases from the furnace of the boiler itself, and then enter the stack. This provision is made to facilitate starting the furnace and so that it can be used for the destruction of material when steam is not required. The combustion is nearly perfect—so perfect in fact that it is impossible, under ordinary working conditions, to detect any smoke issuing from the top of the stack. When the rubbish is delivered damp,

of the tower five pipe ducts extend to the top of the bridge truss. Provision is also made for lighting both buildings.

The plant was designed by H. de B. Parsons, consulting engineer to the Department of Street Cleaning and erected under his supervision.

Inspection of Winslow Brothers Company's Plant.—

A tour of inspection of the new plant of the Winslow Brothers Company, manufacturer of architectural iron and bronze, West Harrison street, Chicago, was made February 3 by upwards of 100 manufacturers, architects and builders. This plant is one of the largest and most complete in its line in the country, and the general arrangement reflects great credit upon the designers. Work on its erection was begun last spring, the removal from the old plant on Carroll avenue commenced in the summer and the new plant was in complete operation early in the fall. All of the buildings are of heavy mill construction and well lighted throughout, special attention having been given to this feature on account of the na-



Fig. 6.—Salvage from the Rubbish.

or possibly wet, there is perceptible a slight yellowish smoke from the stack, but this is never dense, no matter what the weather may be.

The Generator Building

has a frontage of 50 feet on Tompkins street and is 60 feet deep. It is of the same general design and material as the other. The main floor is concrete and there is an upper half floor for the storage batteries. The engines are Ideal cross compound and are supplied with steam under 100 pounds pressure. Each is capable of driving its generator under a 33 1-3 per cent. overload without loss in speed and is capable of speed regulation within 1 per cent. from full load to one-half load. Each engine is provided with a steam separator and the exhaust from each is connected to a Blake jet condenser. There are two 100-kw. and one 50-kw. direct current, 250-volt, Burke engine type generators, the first running at 250 revolutions and the other at 300 revolutions per minute. The generators have an overhead capacity of 25 per cent. for two hours. They are mounted on the engine shaft with an outboard bearing and coupling.

The leads from the generators are laid in tile ducts underground and connect with the switchboard and from the latter to the bottom of the intermediate tower of the bridge. There are four ducts from each generator to the switchboard, 12 from the switchboard to the tower and two to the incinerator building. From the bottom

ture of the material manufactured. The plant comprises seven buildings, as follows: No. 1, fitting shop, 181 x 181 feet; a gallery encircles this entire building, where the smaller work is fitted. No. 2, building 86 x 181 feet, in which are situated the blacksmith shop, storeroom, shipping department and platform and lacquering room. No. 3, office building, 87½ x 141 feet, two stories in height, the lower floor of which is given over entirely to the executive and sales offices and the drafting room, while the pattern storage department is located on the second floor. No. 4, pattern shop, two stories high, 63½ x 141 feet. No. 5, building devoted to the plating and polishing departments, containing a sand blast and Bower-Barff furnace. No. 6, foundry, 141 x 240 feet. No. 7, engine and boiler room, 50 x 91½ feet.

The new freight depot of the Wabash Railroad adjoining the passenger station on Liberty avenue, Pittsburgh, has just been opened. The new station, with terminals, cost approximately \$2,000,000 and consists of an elevated freight house 572 feet long and, including the adjacent tracks, 145 feet wide, with a total length, including the Duquesne Way extension, of 831 feet. Fifty cars can be placed at the freight house at one time for loading and unloading, and the terminal provides for a total capacity of 125 cars, which is sufficient to meet contingencies that may arise for a long time.

Mexican Railroad and Business Notes.

DURANGO, January 31, 1906.—A concession for a standard gauge railroad between the cities of Pachuca and Tampico has been granted to Richard Honey, president and manager of the International and Mortgage Bank, of the City of Mexico, and owner of large iron ore mines at Zimapan, in the State of Hidalgo, near which the road will run. According to the terms of the concession, surveys must commence within six months and 10 km. of the road be completed within two years and six months; thereafter at least 20 km. must be completed each year, so as to finish the main line between Pachuca and Zimapan within nine years. The dates for the extension to Tampico are subject to further arrangement.

The Mexican National Railway Company has completed the surveys for a railroad from Teztlutlán, in the State of Puebla, to Papanitla in Vera Cruz, and to the oil lands of the Oil Fields of Mexico Company. In the event of the railroad company deciding not to construct the line, the oil company may undertake the work.

A narrow gauge road, 28 km. in length, is projected to connect the towns of Ocotlan, in Oaxaca, and San Geronimo Taviche. It will traverse a mining district in which strikes of rich ore have recently been made. Charles A. Hamilton of the San Geronimo Taviche Mining Company, is active in promoting the railroad.

A new concession has been granted to the Dwight Furness Company, merging former concessions covering the construction of a railroad from the city of Guanajuato to Marfil and Irapuato. The road is to be of standard gauge. Thirty kilometers from Marfil to San Gregorio, already constructed, are covered by the concession, which requires that by December 31, 1906, six more kilometers be built and the same number each succeeding year, so as to complete the line by December, 1910.

The narrow gauge line referred to, between Marfil and San Gregorio, which was purchased some time ago by the Dwight Furness Company, will be standardized and extended to Guanajuato and to Salamanca.

The State of Sonora is to have another railroad, a concession for a line of standard gauge having recently been obtained by John Henderson. The road is to run from Port Lobos to the town of Caborca. Six years are allowed for the construction. Surveys are to be commenced within six months and at least 10 km. of track laid within 18 months, the remainder being built at the rate of 10 km. annually.

The Southeastern Railways of Yucatan Company having failed to construct a section of 50 km. of road by November 25, 1905, as stipulated, its concession has been declared forfeited, together with the deposit of \$10,000 made by the company.

The Great Mineral Railroad of Mexico, an Arizona corporation, capitalized at \$3,000,000, has been formed with the object of making important railroad extensions in the State of Chihuahua. The purpose of the company is to take over the 28 miles of narrow gauge railroad of the Pittsburgh & San José Railroad & Reduction Company, running from San José del Sitio, extend it north to the Kansas City, Mexico & Orient Railroad and south to Parral.

A belated railroad project is about to be revived in the State of Yucatan, a concession having been granted many years ago for the construction of a line from San Ignacio to Hunucmá, and which it is now announced Señor Juan N. Martinez will proceed to build.

The construction of an extension of the Durango Central Railway from the mining camp of Descubridora to Indé, in this State, is reported as soon to be undertaken. The distance is about 150 km.

Industrial Notes.

The Mexican Central Railway Company is gradually extending the use of crude petroleum instead of coal under locomotive boilers.

A foundry and machine shop are among the new industries projected in the State of Jalisco, Señor J. G.

Higareda having purchased a site for the erection of such shops at Ameca.

A concession for the construction of a power plant on the Yaqui River, in the district of Sahuaripa, Sonora, and the use of 60 cubic meters of water per second, have been granted to Señor Miguel A. López.

Imports for the first two months of the current fiscal year included machinery and apparatus, \$3,171,907.78; vehicles, \$502,547.84, and arms and explosives, \$811,384.99. The exports in the same months were valued at \$41,232,920.62 Mexican, an increase of \$8,379,223.83 over the total for the two months in the previous fiscal year.

It is announced that the Government port works at Manzanillo, which have been in course of construction for two years, are completed. The improvements include a sea wall and breakwater whose construction cost \$10,000,000. The Mexican Central Railway Company has arranged to buy a large tract of land at Manzanillo for terminal purposes. It is expected that when the Central's Colima extension is completed and the narrow gauge line from that point to Manzanillo has been changed to standard gauge, the port of Manzanillo will become an important traffic centre.

The Central will import a large number of Japanese laborers to work upon the Tuxpan-Colima extension.

Judging from the following paragraph in a City of Mexico daily paper dated December 27, manufacturers of oil heating stoves would do well to push the sale of their specialties in the Valley of Mexico next winter:

Snow caps the mountains about the city this morning and gives the inhabitants the feeling that Christmas time really is here. The chilly element has penetrated the thick walls of the houses of the city, and homes are made comfortable only by the use of small oil stoves. Those families without the advantage of this warmth went to bed early last night for comfort.

The item bears the caption, "Lucky He Who Has a Stove."

The Guadalajara Electric Light & Power Company, known as La Electra, has acquired the concession granted to Fecundo Perez for utilizing the waters of the Santiago River, and is considering the project of establishing a power plant from which to supply electric light and power to the city of Aguascalientes, 100 miles distant.

The Monterey Iron & Steel Company declared a dividend of \$2 per share at the close of the year.

La Compañía Carbonífera de Ciudad Mier has been organized in Monterey for the purpose of working certain coal deposits in the State of Tamaulipas, and may need machinery, &c.

The increase in traffic on the principal Mexican railroads has caused the managements to place large orders in the United States for new freight cars and other rolling stock. The Mexican Central has recently let a contract for 1000 freight cars and gondolas to the American Car & Foundry Company, and is said to be in the market for 25 locomotives. The Interoceanic Railway Company is also increasing its equipment, and is about to place orders for a large number of freight cars, several passenger coaches and baggage cars and two locomotives.

The Motzorongo Plantation Company, in the State of Vera Cruz, operating a private railway for the movement of its products, has placed an order for additional equipment, including one locomotive and 30 steel cars.

J. J. D.

To obviate troubles with locomotive boilers, a French engineer has designed a locomotive with a water tube boiler having two horizontal drums connected by three water legs and some 420 tubes. The fire box is formed by a number of vertical tubes and an extension of the lower drum. Experience having demonstrated that copper tubes would develop minute cracks after short service, steel tubes were substituted, with better results. Owing to the facility with which a fire tube boiler can be forced, the capacity of this locomotive is much greater than that of the ordinary type of similar size, especially on a heavy grade. On down grades the steam pressure can be allowed to fall, with economy in the coal bill. The type is interesting, but will doubtless need developing before becoming commercially successful.

Cutting an Irregular Box Cam with the Aid of an Air Drill.

An irregular box cam and the novel arrangement by which it was cut at the Cleveland plant of the Chicago Pneumatic Tool Company are shown in the accompanying illustrations. Fig. 1 is a view of the process employed and Fig. 2 of the completed work. It will be seen that at one point the groove of the cam is very close to the center of the gear, while it runs close to the rim at another point.

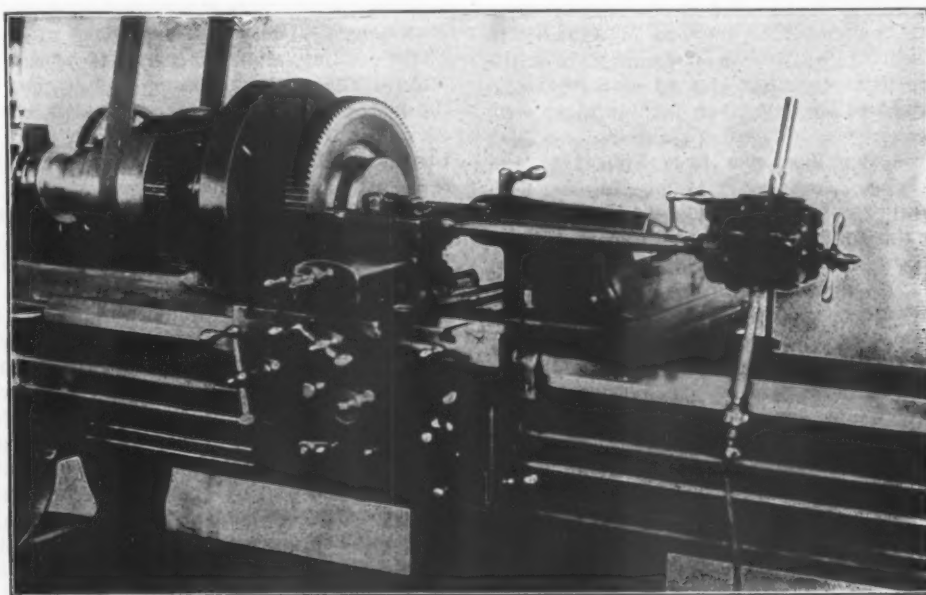


Fig. 1.—The Fixture by Which the Milling Cutter and Air Drill Were Held in the Lathe.

It could not be cut with a single tool, as it was absolutely necessary that the groove of the cam be parallel.

As there was no machine particularly adapted to the work at hand, Henry J. Kimman, superintendent of the shop, devised an apparatus for holding the work on the tool slide of a lathe, while a milling cutter driven by a pneumatic drill did the work. A master cam was attached to the lathe mandrel, with the work in proper re-

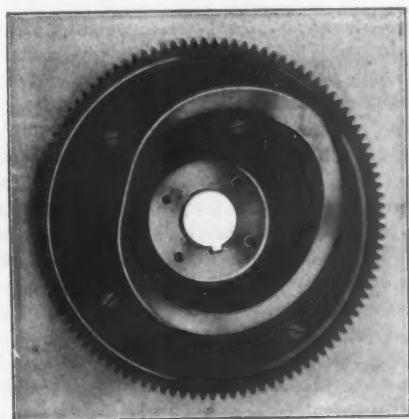


Fig. 2.—The Completed Work.

lation to it, and as the lathe revolved slowly, the slide rest having been previously disconnected from the cross feed screw, the milling cutter arbor was kept in contact with the master cam by a weight fastened to the back of the cross slide. The cutter arbor, where it made contact with the master cam, was of the same diameter as the milling cutter used, which insured an absolutely parallel slot.

A Little Giant air drill, manufactured by the Chicago Pneumatic Tool Company, was used for driving the cutter. The arrangement proved very satisfactory, as the speed could be controlled to a nicety. The fixture cost little to make, it embodied no cumbersome belts or complicated mechanism and it required no more time to set

up the work than would be necessary with an ordinary chucking job.

Ryerson's New Catalogue.—A highly creditable piece of work in catalogue production has been received from Joseph T. Ryerson & Sons, large iron and steel machinery distributors, Chicago. In its presentation of finished iron and steel material it covers a wider scope than heretofore attempted, including practically all of the heavier lines and many of the lighter ones, accompanied by numerous

tables concisely and perfectly arranged. The book is compiled in two sections—one devoted to iron and steel commodities and the other to machinery. A thumb index subdivides the first part into the following divisions: Structural steel, plate steel, sheet steel, bars, tool steel, shafting, stay bolt iron, rivets, boiler tubes, furnaces, boiler fittings, nuts and bolts. The machinery section is subdivided into hydraulic machinery, punches, shears, riveting machines, air compressors. The catalogue is further indexed by alphabet, making reference easy to the various classifications. It is loose leaf for the insertion of additional pages from time to time. The catalogue is invaluable for the tables which it contains. Included are weights and dimensions of structural shapes, standard steel plate extras, weights of circular boiler heads, standard gauges of plates, estimated weights of black and galvanized sheets, weight of corrugated sheets per square, steel hoop extras, standard iron bar classification and other tables relating to other products. The machinery listed includes practically everything used in the working of iron and steel. The catalogue is 11½ by 9 inches, bound in flexible morocco leather cover. Heavy glazed paper is used, bringing out the cuts, all of which are original, in striking shape. Many of the left hand pages present vignetted views of the company's warehouse and stock piles of material. A foreword preceding the catalogued products outlines the development in the business which has led up to the issuance of this comprehensive work.

The report of the Isthmian Canal Commission, recording its decision in favor of an 85-foot level lock canal, was submitted to Secretary Taft February 3. It is accompanied by the report of the Board of Engineers, the majority of whom declared for a sea level canal. It will now be for Secretary Taft to express his own views upon the great project in an indorsement when transmitting the papers to the President. It appears that Rear Admiral Endicott, the naval member of the commission, was the only one who differed with the majority and favored a sea level canal as recommended by the majority of the Board of Consulting Engineers.

The Revision of the Canadian Tariff.

A Setback for the Movement for Retaliation Against the United States.

The Canadian tariff is to be revised at the coming session of the Dominion Parliament at Ottawa. As a preliminary to the revision, which will be undertaken by the Dominion Government, three members of the Cabinet—H. S. Fielding, Minister of Finance; W. Paterson, Minister of Customs, and L. P. Brodeur—were engaged from the beginning of September to the end of January in holding public hearings all over the Dominion. For the most part of the time that has elapsed since the commission was organized on September 3, these three Cabinet Ministers have lived on board a railroad car. They have traveled the Dominion over from Vancouver and Victoria, where work began, to St. John, Halifax, Sydney and Charlottetown. They have doubled back on their tracks over half the Continent; and in all they have traveled nearly 15,000 miles, and have held public hearings in every Province, and 50 towns and cities in the nine Provinces. A special correspondent of *The Iron Age*, who accompanied this commission on its tour of inquiry, makes the following report:

Everywhere these sessions of the commissioners have been opened to the public, open to any man who had any ideas to lay before the commission with regard to the tariff or the general fiscal policy of the Dominion. Every session, too, has been open to the press. There have been no private hearings; and except in one or two instances, where workshop costs were submitted in proof of statements, no data to be regarded as confidential were received by the commission.

The Last Canadian Tariff

was enacted in 1897, the year after the Liberals were returned to power. When the change of Government took place, the protective tariff of the Macdonald and Tory régime (1879 to 1896) was in force. The Liberals, for 16 years, had opposed the protective policy of the Tory government; and they were returned to power in 1896 on a programme which committed the Liberal party to a tariff for revenue only. But their pledge was ignored in 1897. The old tariff, with increases in many schedules in favor of Canadian manufacturers, was continued; and the only new departure was the enactment of a preference for Great Britain—the establishment of the system under which at the present time all British goods imported into Canada, not on the free list, pay only two-thirds of the duties imposed on imports from the United States and other foreign countries.

The Canadian tariff of 1897 preceded by a few months the Dingley act in the United States, and about 1899 the Canadian Manufacturers' Association began an agitation for another revision of the Canadian tariff, by which Dingley rates should be imposed all through the schedules. That association not only desired Dingley rates in all schedules against the United States, but it objected strongly to the British preference, and it hoped by the revision of the tariff to get more protection alike against the United States and against Great Britain.

For some time this agitation made little headway. But about 1901 the Tory politicians at Ottawa associated themselves with the movement, and the Tory and Opposition newspapers everywhere took it up with much zeal. One member of the Laurier Cabinet—J. I. Tarte, Minister of Public Works—in 1902 unequivocally committed himself to Dingley rates and lost his portfolio in consequence. By 1904, the year of the general election in Canada, the movement had become so threatening and embarrassing to the Laurier government and the Liberals, or had the appearance of being so, that in the autumn of that year, before the elections took place, the Government gave a pledge that the tariff should be revised in 1906. This was all to which the Government committed itself; and as at the general election it was returned by a larger majority than had supported it in the Parliament of 1900-1904, it went into the present revision pledged only to an inquiry, and with an absolutely free hand when it should come to dealing with the demand of the Canadian Manu-

facturers' Association for Dingley rates and more protection against Great Britain than is afforded by the preference tariff.

The Commission's Policy Outlined.

The freedom that the Government thus enjoyed was manifested at the earliest sessions of the commission. The Canadian Manufacturers' Association was bluntly told, 1, That the commission would give no support to the plea for Dingley rates; 2, that it was not the policy of the Government to enter on a tariff war with the United States by adopting retaliatory measures, and, 3, that the British preference was to stand, and if found practicable was to be greatly extended in return for the valuable sentimental preference which increasingly since 1897 the people of Great Britain have given to Canadian agricultural produce.

This was an unexpected setback to the Canadian Manufacturers' Association, which for four or five years had been clamoring for Dingley rates and retaliation against the United States; and as these pronouncements were made early in the sessions in manufacturing Canada, they took much of the fighting interest out of the hearings of the commission. But as the Canadian Manufacturers' Association's campaign had been arranged in advance of the sessions of the commission, and as each section and subsection had had its part allotted to it when the tariff commission should reach its territory, the pleas for Dingley rates and retaliation were put in everywhere. So were the pleas for more protection against Great Britain. The commissioners, however, never varied from the attitude in these questions which they took up at the outset of the inquiry; and again and again they made it understood that there was to be no retaliation against the United States, and no turning back on the tariff policy of Canada toward Great Britain, which was adopted by the Laurier government in 1897.

Iron and Steel Hearings.

The first discussions on the iron and steel schedules with which henceforward this report will be exclusively concerned was at Montreal, November 7. When the commission was on the Pacific Coast in September there had been proposals for bounties for steel shipbuilding, to be paid out of the Dominion treasury. The discussion of these was not, however, carried very far. It was agreed between the commission and the shipbuilders that the whole question should be adjourned to the final and supplementary hearings at Ottawa. As these hearings, at the time of writing, have not yet been held, I deem it best to deal with these bounty proposals in a postscript or in a subsequent letter. All that it is necessary to say here is that the commission gave a sympathetic hearing to the proposals made at Victoria, British Columbia; and that the postponement of the matter to the Ottawa hearings was on the suggestion of the commission, and was made in order that the shipbuilders on the Pacific, on the Great Lakes, and on the Atlantic could get together, and in conference determine on a general scheme for shipbuilding bounties to be laid before the commission at the close of its tour.

The petitions which came before the commission at Montreal regarding the iron and steel schedules were from the Dominion Wire Mfg. Company, the Montreal Rolling Mills Company and the Peck Rolling Mills Company. J. C. McCormick acted as spokesman for all three companies.

The procedure of the commission was that the interests appearing before it first read their petitions, then the commissioners submitted the petitioners to a pretty searching examination and cross examination as to the working of the present tariff, as to the general condition of the industry concerned, and as to the capitalization and dividend earnings of the companies urging changes in the tariff. The petitions and this talk across the table were all embodied in the records of the commission.

Attacking the United States Steel Corporation.

In the petition presented by Mr. McCormick it was urged that there should be no change in the existing rates on brass wire (10 per cent.), copper wire (15 per cent.) and wire of all metals and kinds "not otherwise provided for" (20 per cent.), unless the Government decided to put a duty on rods for the manufacture of these wires, in which case the petitioners asked that such duty be added to the present protection on wire. Barb wire and galvanized wire for fencing, Nos. 9, 12 and 13, are now on the free list, and in asking for a duty of 20 per cent. these Montreal petitioners made the first of several attacks before the commission on the United States Steel Corporation and its subsidiary companies. It was complained in this case that the United States Steel Corporation dominates the Canadian wire trade. The corporation, it was said, is easily able to undersell the Montreal mills, but it permits them to produce about 10 per cent. of the wire needed in Canada, subject to the conditions, however, that the steel rods required for the manufacture of this wire shall be purchased from the corporation, and that the corporation shall fix the price at which wire shall be sold to all the Canadian jobbers.

It was elicited by questions from the commissioners that the trade of the Montreal wire mills is confined to the Island of Montreal, and that when the mills receive an order for Toronto or westward of Toronto it is turned over to the United States Steel Corporation and the Montreal mills receive a commission on the business.

The relations of the Steel Corporation to Canadian mills came up much more sharply at St. John, New Brunswick, January 9, and as I am here following the proceedings of the commission only in so far as they affect the iron and steel schedules and not in chronological order I may as well deal with this later onslaught at this point.

James Pender's Plea for a Higher Wire Duty.

The St. John attack was made by James Pender, a nail manufacturer there, who appeared before the commission to support the same plea that the Montreal wire men had put in at Montreal—a duty of 20 per cent. on barb and galvanized wire. Mr. Pender is prepared to go into the wire business if a 20 per cent. duty is imposed, and he assured the commission that the domination of the wire business of Canada by the United States Steel Corporation could be shaken off if this protection were given in the new tariff to Canadian wire mills. He was equally sure that the farmers would have to pay no more for their fencing if it were provided in the new tariff act that the duty was not to become operative until five or six months after the tariff of 1906 became law.

Mr. Pender's speech was the most impassioned that the commission heard anywhere on its travels and aroused great applause. The charge on which he laid most stress, and concerning which he grew most fervently eloquent and patriotic in sentiment, was that the United States Steel Corporation had threatened that if the wire nail manufacturers of Canada did not contract to buy all their steel rods from it at prices then \$3 in advance of the price at which they could be bought in England or Germany the corporation would invade the Dominion, slaughter the market and close all the Canadian factories. Mr. Pender indorsed the policy of giving the Canadian furnaces and rolling mills a protection of \$7 a ton on their output—the policy that is now in force; and he assured the commission that now that the Dominion Steel Company at Sydney had shed the "American windbags" who crossed the line about 1899 to teach "us Canadian farmers how to make iron and steel" the industry at Sydney was undoubtedly going ahead. The rod mill there, under the management of Nova Scotia men, had beaten the record of any similar continuous wire rod mill in the United States. It had turned out 67,000 tons a month, as compared with 62,000, which was the best record of any similarly equipped American mill.

The Duty on Castings.

The wire sections in the iron and steel schedules were not the only sections in which increases were asked by petitioners at Montreal. J. R. Wilson, vice-president of the Montreal Steel Company, and Mr. Blackwell, super-

intendent of the company's plant, urged an increase of 10 per cent. in the duty on steel castings for engineering, electrical and bridge work. Under the 1897 tariff these castings pay 25 per cent. The ground on which an increase was asked was that the hematite pig iron used must be imported from England and Scotland. It was stated that except for Stewart iron, made in Ohio, there is no pig iron suitable for steel castings available either in the United States or Canada.* Best splint coal from Scotland has also to be imported for generating the gas used in the production of this steel, as there is no coal in Canada sufficiently low in phosphorus and sulphur. These importations, which are inevitable, add to the cost of production, and they were cited as justifying the request put forward in behalf of the Montreal Steel Company.

The Steel Rail Trade.

Montreal was the first place at which the Tariff Commissioners came in contact with the iron and steel industry, and many questions were put to the witnesses as to the condition of the industry. One witness engaged in the manufacture of switches and frogs admitted that the two companies now making steel rails in Canada, the Dominion Steel Company and the Algoma Steel Company at Sault Ste. Marie, had not put up prices on rails to the limit of the \$7 duty.

It was stated that most of the girder rails used by the street car companies in Canada are imported from Germany. Mr. Fielding, president of the commission, eager here as at all points on the commission's tour to ascertain whether Canadian trade with Great Britain could not be increased, inquired whether these rails could be imported from Great Britain. The reply was that a large proportion of the tonnage of girder rails used by English municipalities was imported from Germany. The ordinary T-rail, such as could be used for rural districts, could be made in Canada, but as yet there was no plant in the Dominion equipped for the manufacture of rails serviceable in large cities.

At Montreal, as also at Hamilton and London, it was stated that there was a scarcity of steel billets in Canada and that the steel making capacity is not now equal to the demand.

The United States Often in Evidence.

Nine-tenths of the petitioners not concerned with the British preference came before the commission to get either raw materials from the United States on the free list or at a reduced rate of duty, or to ask for more protection against United States manufacturers. Not infrequently petitioners asked for both lower duties on raw material and higher duties against imports in their line of production from the United States.

At Montreal the Naugatuck Valley brass industry of Connecticut was represented in a movement for lower duties on brass. Walter Gross of the Ontario Lantern & Lamp Company, Port Hope, was the advocate of this interest. He urged that as there is only one small brass factory in Canada and as it is impossible for this Toronto plant to begin to meet the great variety of the needs of lamp manufacturing no duty should be imposed on imported brass. This was in anticipation of a request for protection from the existing factory. There was, Mr. Gross said, not a sufficient call for staple gauges of brass in Canada to keep one mill properly running. The different gauges and sizes were so numerous that it was not possible for one factory to supply them all, and as the manufacturers of lamps had to compete with manufacturers in the United States and compete on narrow margins, it was urged that it was only fair that they should obtain their raw material on easy terms. At Toronto and at Hamilton there was much opposition to a protective duty on brass. At Hamilton the opposition came from the Canadian branch of the Westinghouse Company.

The last petition at Montreal affecting the iron and steel schedules was a request for lower duties on steel imported for files.

The Duty on Stoves.

At Toronto, London, Hamilton and Fredericton, N. B., there were appeals for an increase in the duty on stoves

* NOTE.—This is very amusing, as the United States manufactures about 500,000 tons of steel castings annually, using domestic pig iron.—THE EDITOR.

from 25 to 35 per cent. Between 70 and 80 firms are engaged in making stoves in Canada. Among them the stove men do a business of \$4,500,000 a year and control nine-tenths of the total business. But in Manitoba and in the Far West new settlers are largely buying stoves from St. Louis, St. Paul and Minneapolis. They are buying them because they are cheaper than any Canadian stove on the market and because manufacturers in these American cities can get a lower freight rate into the Northwest than manufacturers in eastern Canada.

The Canadian stove manufacturers, however, want all of this remaining tenth of the business in the Dominion in spite of the disadvantages of the location of their plants, and their request was for such an increase on the cheaper grades of stoves as will prevent American manufacturers getting access to the immigrants now settling in such large numbers in the West.

The stove men, like many witnesses who came before the commission, complained much of freight rates in Canada. Mr. Fielding, however, had one answer to all these complaints as to railroad rates. If railroad conditions were uniform it might be possible to correct inequalities by tariff legislation, but the conditions are peculiar to different parts of the Dominion and they cannot be reached by the tariff.

Northwestern Stove Trade in American Hands.

At Fredericton, N. B., the stove men admitted that geographically they were badly placed for securing their share of the trade in the Northwest, but they urged that it was the business of the Government when it was framing a tariff to prevent any Canadian business from going to American manufacturers.

At Hamilton one of the petitioning stove makers showed that in the year ending June 30, 1905, the value of the stoves sent in from the United States was \$400,000, as compared with \$127,000 in 1901. He attributed much of this increase in the sale of American stoves to the liking of the newly arrived immigrants from the Northwestern States for Yankee stoves. He threw himself into the role of a calamity howler and declared that it would be impossible for the stove makers of Canada to pay living wages to their work people were these growing American importations not stopped.

Mr. Paterson, Minister of Customs, inquired: "Are you making the kind of stoves the new settlers in the Northwest want?" "We are making everything," answered the Hamilton stove man; "we follow the Americans very closely and when we see that there is a run on any design or style we make it." With freight rates of 48 cents per 100 pounds from St. Paul and 75 cents from Hamilton, added this witness, stove makers in eastern Canada could not hope to get the business in the far West without additional help in the tariff.

"If your difficulty arises from freight rates," said Mr. Fielding, "I do not see how we can help you. The American stove manufacturer is favorably placed by reason of distance. Would not the Western farmers think it very hard if they were deprived of that natural advantage? The commission has already been in the Northwest. We have to go back there, and we know that this stove question is one which is very much in the minds of the people of the Northwest." "We feel," answered the stove man, "that we should be put in shape to get a return upon our investment. There is more than \$1,000,000 invested in the stove business here in Hamilton." Mr. Fielding reminded him that by far the larger proportion of the stove manufacturers in Canada were well placed for commanding Canadian business and that the tariff could not be arranged to give Hamilton stove makers all the business thousands of miles away. "In the West," he said, "there will be a strong objection to a tariff framed to that end."

"We are Canadian manufacturers," answered the stove man, "and we should have the market." "You will have difficulty," said Mr. Fielding, "in persuading the farmer on that point." "But in time you will benefit the farmer," was the parting shot of the stove man in this quick interchange across the table as he vacated the witness chair.

Plumbers' Supplies.

Up to the present time the manufacturers of plumbers' supplies have put in no appearance before the Tariff Com-

mission. They are under a cloud, owing to the extraordinary exposures which have been made in the Toronto criminal courts. These exposures were just beginning when the commission was in session for a week in Toronto, and they are partly responsible for an appeal that was made there for an amendment to the anticomboine clause, which has been in the Canadian tariff since 1898.

Under the clause as it now stands an order in council can be passed withdrawing the protection of the tariff from any industry which is in a combine and in which combine tactics are used to force prices up unduly and end competition. Before such an order can issue proof must be forthcoming in one of the higher courts that combination and unduly high prices exist; and it is left to the common informer to go into the courts to establish these facts.

As a result only one order in council has been issued in the last seven years; and the petition put in at Toronto was that a crown prosecutor, paid out of the Dominion Treasury, should be appointed by the Government to institute these legal proceedings and that the costs attending them should also be defrayed out of the Dominion Treasury. There is every likelihood that an amendment on these lines will be made in the tariff of 1906, because the discovery by the provincial crown prosecutor of 70 combines in Ontario, through proceedings for criminal conspiracy, has aroused public attention from one end of the Dominion to the other.

Farm Implements.

At Toronto the Massey-Harris Company asked that the duties on farm implements should be increased to 25 per cent. The present duty on mowing machines, harvesters, reapers, cultivators, harrows, horse rakes, seed drills, manure spreaders, weeder and maleable sprocket or link belting chain for binders is 20 per cent.

The increase was asked on the same ground as that put forward by the stove men, because in the Canadian Northwest American manufacturers are getting some of the business of the new settlers. The same company also urged that a much sharper lookout be kept at the custom houses in the Northwest to prevent new farming machinery from being carried in from the United States as settlers' effects, which are admitted duty free. Mr. Paterson, speaking for the Customs Department at Ottawa, declared that no new machinery was ever passed through the custom houses as settlers' effects, a statement which brought the reply from the implement men that new machinery, or what looked very like new machinery, was splashed with mud by American farmers going into the Canadian Northwest to give it the appearance of having been used.

American trade with Canadian settlers in the Northwest is giving Canadian manufacturers much uneasiness, for there were many appeals to the commission to amend the tariff so as to shut American manufacturers out of these new provinces. One of these was from the coffin manufacturers of Hamilton, and there was a similar plea from the coffin men at Three Rivers, Quebec. Still another of these pleas for the reservation of the trade of the Northwest for Canadian manufacturers was put in at London by a pump maker, who asked a protection of 35 per cent., instead of the present duty of 25 per cent., because American pumps are going into Winnipeg.

(To be continued.)

Eight additional rounds in the Government test were fired out of the 6-inch Brown wire gun at the Sandy Hook proving grounds February 3, making a new world's record as to velocities for that calibre, length of gun, weight of projectile and powder charge. Each of the last six rounds was fired with a 100-pound projectile and 74 pounds of smokeless powder, giving a velocity of 3455 feet per second, along with normal pressures of about 45,130 pounds to the square inch.

The McClintic-Marshall Construction Company, Pittsburgh, has opened an office in the Missouri Trust Building, St. Louis, Mo., in charge of G. I. Finley, contracting engineer.

Blast Furnace Charging Apparatus.

A device for charging blast furnaces has been so designed that the contents of the hopper may be directed toward the sides of the furnace or may be divided into two streams, one flowing toward the middle of the furnace and the other toward the sides. The inventor is Gibbon C. Shackleford, Allegheny, Pa. Fig. 1 is a sectional elevation of the upper portion of a blast furnace showing the arrangement of the charging apparatus. In Fig. 2 the bell is shown as lowered. There is the usual hopper *a*, with its lower sides *b* converging and having a central discharge opening. The opening is closed by the bell *c*, which is of the usual shape and construction and fits closely into the opening in the hopper. The distributing bell *d* has its upper end cut away so as to form an opening into which the main bell will fit, closing the opening in the distributing bell. The edges of the opening in the upper end of the distributing bell rest upon a seat, *e*,

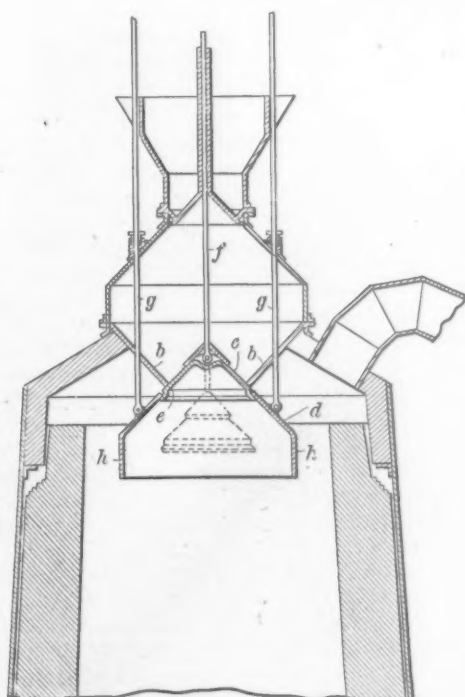


Fig. 1.

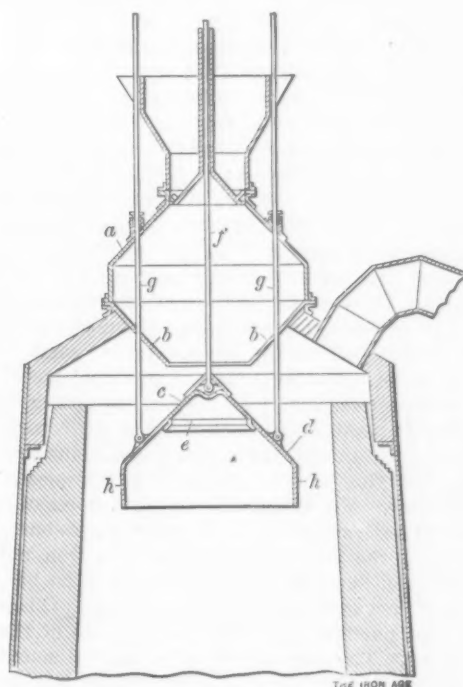


Fig. 2.

Blast Furnace Charging Apparatus.

formed in the periphery of the main bell, the opening in the distributing bell being at least equal to the opening of the discharge hopper. The main bell is connected by a rod, *f*, to the bell operating mechanism. The distributing bell *d* is similarly connected by rods *g* to a raising and lowering mechanism independent of it which operates the main bell.

If it is desired that the charge be deposited in the middle of the furnace the main bell is lowered, as shown by dotted lines in Fig. 1, so that the entire contents of the hopper will pass down through the opening in the hopper and also through the distributing bell. As the charge strikes against the lowered bell it is thrown outwardly, but the outward movement will be checked by the curtain wall *h* on the lower end of the distributing bell, and thus the charge will be directed in straight lines to the middle of the furnace. On the other hand, if it is desired to direct the contents of the hopper to the sides of the furnace both bells are lowered simultaneously, as in Fig. 2, and the contents of the hopper are directed by the sloping sides of the two bells to the sides of the furnace. It will be noted that the main bell *c* is the sole means of closing the hopper.

Wednesday, February 7, was the second anniversary of the great Baltimore fire. The *News* of that city in an article referring to what has been done in rebuilding

says that of the 1343 lots made vacant by the fire, only 224 are now vacant, the number built up since the fire being 465, while about 700 have been acquired by the Burnt District Commission for the widening of streets and docks. Building permits issued since the fire number 665. Those issued since February 7, 1905, number 143. The value of buildings destroyed was estimated at \$12,908,300, and the value of buildings erected since the fire is put by the building inspector at \$20,000,000. Of the ground space originally devastated 73 per cent. has been rebuilt or improved.

National Tube Company Improvements.—The new plate mill at the National Department of the National Tube Company, McKeesport, Pa., has just been started. This is a part of the new plant at McKeesport on which work was begun a year and a half ago by the National Tube Company. The third blast furnace was put in operation the last week in December, and the new slabbing mill is also ready to start. The skelp mills will be

put in commission successively as soon as they are ready for operation. The present pipe mills will be replaced with new mills, but no work of any consequence has yet been done in this department.

Tests of a 50 horse-power suction gas producer, in connection with a 36 horse-power vertical two-cylinder engine, installed at the Poughkeepsie water works, have well shown the economical possibilities of the small producer and engine plant. The engine is belted to a 10-inch volute pump. During the tests the power developed at the shaft of the engine was 38.8 horse-power. The coal consumed per horse-power amounted to 1.23 pounds per hour. The duty of the entire plant was 89,200,000 foot pounds per 100 pounds of coal fed to the producer. The combined efficiency of the pump and engine, as determined by the test, was 55.7 per cent.; efficiency of pump, 60.7 per cent.; of engine alone, 91.8 per cent.

A map of its transmission lines, recently published by the Niagara, Lockport & Ontario Power Company, shows that in addition to building lines to Lockport, Rochester and Syracuse power transmission lines are projected to Toronto, to Erie, Pa., and to Watkins, Binghamton and Elmira and intermediate towns in western and central New York. The map shows 12 transformer stations located at convenient points.

New Publications.

Elementary Practical Metallurgy of Iron and Steel.

By Percy Longmuir. 12mo. Pages, 269; illustrations, 64. Published by Longmans, Green & Co., London and New York.

The author is a Carnegie research scholar and metallist of the Iron and Steel Institute, and has presented several papers before that society and other engineering bodies. Anticipating the inquiry why another work on the metallurgy of iron and steel is needed, the author explains that he has undertaken to provide a book which shall be really an introduction to metallurgical study and one written from a practical standpoint. Fifteen years' intimate contact with Scotch and English workmen engaged in iron and steel manufacture have shown him that much that is written on metallurgy has served only to discourage the practical man, so large a proportion of such literature being beyond the range of every-day practice. The chapter titles indicate the ground covered and are as follows: 1, Refractory Materials; 2, Metallurgical Fuels; 3, Iron Ores and Their Preliminary Treatment; 4, The Blast Furnace and Hot Blast Stoves; 5, The Work of the Blast Furnace; 6, The Metallic Product of the Blast Furnace; 7, The General Properties of Cast Iron; 8, Pig Iron for the Steel Maker, Cast Iron in the Foundry; 9, Remelting Cast Iron; 10, Malleable Cast Iron; 11, Wrought Iron; 12, The Cementation Process; 13, Steel; 14, The Crucible Process; 15, The Bessemer Process; 16, The Open Hearth Process; 17, The Production of Sound Steel; 18, Metallography of the Heat Treatment of Steel; 19, The Metallography of Hardened Steels; 20, The Special Steels.

In its answers to scores of questions asked by those who would find out the reasons for the various procedures in iron and steel manufacture the book is admirable because of its clear and simple style. It is what it professes itself to be, an introduction to practical metallurgy. The student who would go deeper has plenty of literature at his disposal. Naturally there is little room for originality in such a work, the author's task being that of sifting and clarifying what is contained in volumes of exhaustive treatises. Mr. Longmuir has paid particular attention in his investigations to cupola practice, his chapters on Cast Iron in the Foundry, Malleable Cast Iron and Remelting Cast Iron being of special interest. The general properties of cast iron are well summarized in Chapter 7, which deals particularly with the influence of the various metalloids. The importance of producing sound steel is recognized in Chapter 17, which strikes one as rather brief for so important a subject. However, the author has stuck well to his intention to prepare an elementary treatise, and has succeeded in making it suggestive rather than comprehensive. The last three chapters, which deal with the metallography of steel and with special steels, embody the results of the more recent research in these important fields.

Forty Years an Advertising Agent. By George P. Rowell. Published by Printers' Ink Publishing Company, New York.

To the many who know Mr. Rowell personally his series of articles in *Printers' Ink* has been the source of much delight during the past year, when it was published. To the even larger number of younger men who have become connected with what is now a recognized profession the career of a leading pioneer in it must naturally possess much interest. We venture to believe, however, that the story of the active life of an enterprising, shrewd and, we might almost say, quaint man will be read with satisfaction and profit. That larger public has now access to the series in convenient shape in the reprint in book form. It is entertainingly written, full of charming reminiscences, with many flashes of humor, abundant evidence of good, hard common sense and at times almost amusing candor. We may confess to having turned to the series week after week with pleasant anticipation and to looking forward to dipping into the book from time to time in the future. We would be glad to influence others to read it, confident that it will give them pleasure and profit.

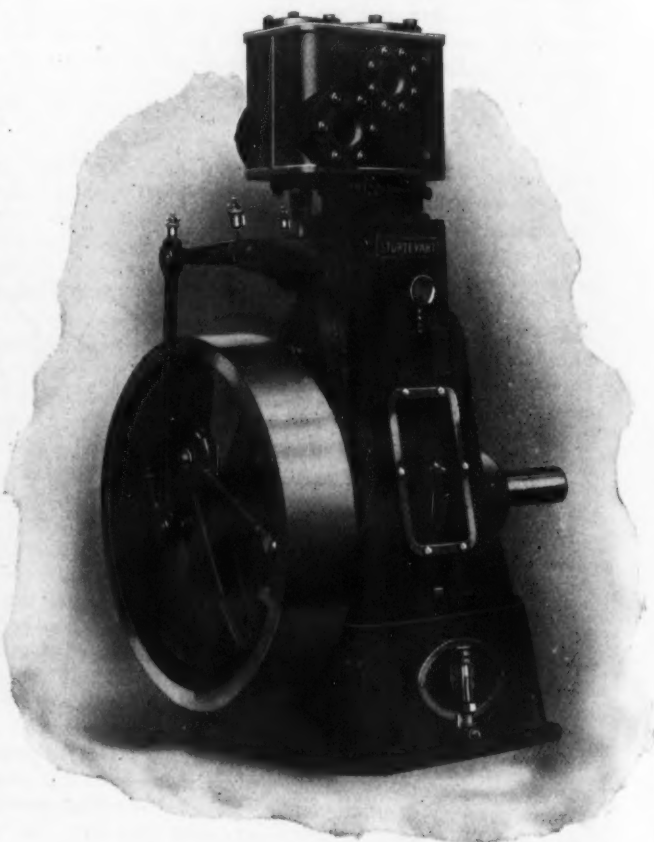
The Industrial Magazine of Pittsburgh is the title of a newcomer in the journalistic field, whose effort will be

to promote the interests of that great manufacturing center. Charles E. Wigginton is the editor.

Sturtevant Vertical Engines.

Maximum power in minimum space, the need of little attention and close speed regulation, have been the principal aims in the high speed and automatic vertical engines known as class VS5, built by the B. F. Sturtevant Company, Hyde Park, Mass. They are therefore suited to many classes of work, but particularly to the direct connected driving of electric generators. High rotative speed without excessive piston travel has been obtained by making the cylinder diameter large and the stroke relatively short. An example of this line of engines, adapted for general use, is shown in Fig. 1. Where the engine is to be used in a generating unit it is mounted on a subbase extended to receive the generator.

The most interesting feature of these engines is the provision for forced and continuous lubrication. Within



The Class VS5 Vertical Engine Built by the B. F. Sturtevant Company, Hyde Park, Mass.

the base, as shown in Fig. 2, is contained a submerged oil pump operated by an eccentric on the crank shaft. The oil is drawn from the reservoir and forced through pipes and internal passages in the moving parts of the crank pin, wrist pin and main bearings. As the engine is double acting there are two periods during each revolution when the stress on these parts is reversed, giving an opportunity for the pump to supply a fresh film of oil between the surfaces. Distributed at a pressure of 10 to 20 pounds per square inch the oil maintains a film between rubbing parts, preventing their actual contact, and makes possible a mechanical efficiency claimed to be over 90 per cent. An oil tight enclosing frame and centrifugal oil guards on the shaft where it passes through the casing prevent the escape of oil, which is continuously returned to the bearings.

Within the casing a water shed partition prevents the mixing the water from the piston rod stuffing box and oil in the case, and also keeps the latter from finding its way to the interior of the cylinder. Openings under the cylinder allow the adjusting of the piston rod stuffing box without removing the frame covers, and all other parts are readily accessible when the covers are removed. Frequent inspection, however, is not necessary, largely

because the water shed partition protects the parts from dirt and accident.

The cylinder and valve chamber are cast in one piece and relief valves are provided to prevent damage by entrained water in the cylinder. The valve is of balanced piston pattern, provided with snap rings and works in a bushing easily renewed when worn. A Rites governor on the fly wheel controls the point of cut off and regulates the speed within $1\frac{1}{2}$ per cent. variation from no load to full load. The piston is a hollow iron casting, internally ribbed, secured to the rod with a taper fit and provided with turned packing rings.

The piston, connecting rods and crank shaft are each forged from a single piece of open hearth steel. The connecting rod boxes are lined with Sturtevant white metal; the cast iron cross head is equipped with adjustable shoes and a nickel steel wrist pin and the crank pin is of unusually large size. All parts are interchangeable.

The engines are made in 18 sizes, from 5 x 5 inches to

been proceeding by open cuts and tunnels. The magnesite is transported $\frac{1}{2}$ mile over an aerial tramway to bunkers and thence by traction engines and iron wagons to Livermore. The wagons used contain $17\frac{1}{2}$ tons each. The capacity of production is about 100 tons a day. The people who are developing the deposit have built about 25 miles of road.

Near Portersville, in Tulare County, about 275 miles southeast of San Francisco, just on the edge of the Kaweah quadrangle, lies the second magnesite deposit visited by Mr. Hess. The mines are only about 4 miles from Portersville, on a down grade road, so that the item of haulage does not add much to the expense of production. The mines, which are worked by tunnels and open cuts in veins, are operated by the Willamette Pulp & Paper Company of San Francisco. W. P. Bartlett is superintendent of the works. Nearly all the magnesite produced here is burned at the mines with fuel oil, just as limestone is burned to make lime. The burned residue—magnesia—which is used by paper mills for digesting and whitening wood pulp, is shipped to Oregon City, Ore.

The small portion of magnesite not burned is used in its raw state by the Western Carbonic Acid Gas Company of San Francisco for the manufacture of liquid carbonic acid gas in its plant at Sedan.

From Portersville Mr. Hess went to Chiles Valley in Napa County, where there are old magnesite deposits which were worked for about 12 years but are now idle. These deposits are owned by the same people that control the Portersville deposits. The magnesite here is less pure, however, and the haul is much longer, so that they see no reason for operating these deposits at present.

The Walters deposits, in Pope Valley, Napa County, were next visited. The haul from there to Rutherford, the nearest station on the Southern Pacific Railway, is about 22 miles. Although the magnesite here is good the deposits are not worked. They have recently changed hands, however, and with the chance for a new electric road in this locality the deposits may possibly be developed in the near future.

Magnesite is used not only as an ingredient of magnesite brick, but also in the manufacture of carbonic acid gas and in the manufacture of paper from wood pulp. The carbonic acid gas is liquefied and shipped in steel cylinders to all the Pacific Coast and Southwestern States, where it is used for soda water fountains, for refrigerating machines and for maintaining the pressure on beer barrels and keeping the beer fresh. In the manufacture of paper magnesite is transformed into a sulphite of magnesia and used as a digester for the wood pulp. Small amounts of magnesium chloride are used for making cement. Combined with asbestos, magnesite is also employed as a filler in steam pipe casings. But it is as a material for the manufacture of refractory brick that magnesite finds its only considerable market, and with the development of that industry in this country the exploitation of California's magnesite deposits would greatly increase.

The per capita circulation of money in the United States was figured at \$31.88 on February 1, being greater than ever. The population of the United States on that date was estimated at 84,077,000.

The Republic Iron & Steel Company's production is now made up of 70 per cent. steel and 30 per cent. iron. When it began business the figures were just the reverse.

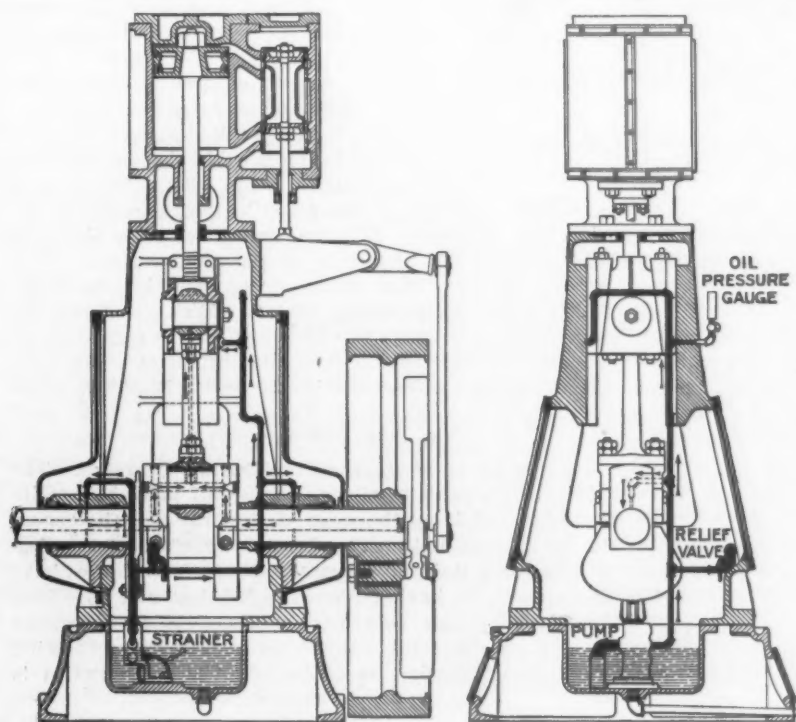


Fig. 2.—Vertical Sections Showing the Lubricating System of the Sturtevant VS5 Engine.

12 x 10 inches, and range in weight from 1000 to 4300 pounds. The smallest size occupies a floor space of 34 x 26 inches and stands 42 inches high and the largest size is contained in a cubic space of 57 x 42 x 84 inches.

The Magnesite Deposits of California.

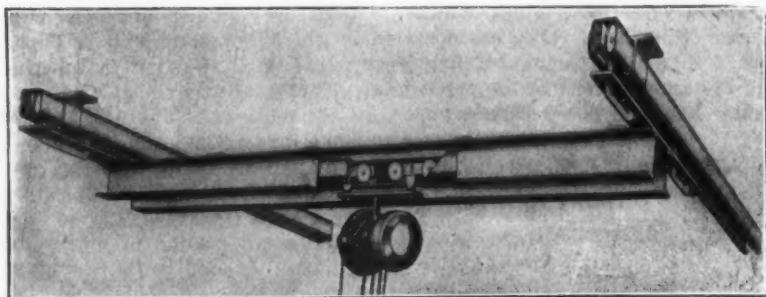
The market for native magnesite may be influenced in future by the fact that a factory for the manufacture of magnesite brick has recently been erected at East Oakland, Cal., says the United States Geographical Survey in a recent bulletin. The magnesite brick made in this country has up to the present time been manufactured in Pennsylvania out of magnesite imported from Greece or from Austria, which has been cheaper than magnesite brought across the country to the steel furnaces from California. Nearly all the magnesite known in the United States is found in a belt of serpentine that extends from southern California along the coast range to Oregon. Four of these deposits were visited and examined last summer by Frank L. Hess of the United States Geological Survey.

The first deposit visited by Mr. Hess was in the north-eastern part of Santa Clara County, 32 miles southeast of Livermore. Here is a deposit on the exploitation of which a large amount of money has recently been spent. Several big veins have been opened and development has

A Light Traveling Hand Crane.

A new form of overhead travelling crane manufactured by the New Jersey Foundry & Machine Company, 9 Murray street, New York, is shown in the accompanying illustration. It is especially adapted for comparatively light loads and short spans—that is, loads up to 3000 or 4000 pounds and a span of 25 feet or less, or such service as is common in icehouses, warehouses, store-rooms, shops, &c.

The crane itself is made up of two channel beams placed back to back, with a run of Coburn track suspended be-



A Light Hand Operated Overhead Traveling Crane, Manufactured by the New Jersey Foundry & Machine Company, New York.

tween them by brackets, in which the trolley carrying the hoisting apparatus is operated. The main runways are of Coburn track and the trolleys operating in them are fitted with rocker pendants, to which the ends of the crane are attached through a plate in such a way as to distribute the load equally on the 16 wheels. The trolleys have roller bearings and all wearing surfaces are amply large to insure long life and ease in operation.

A special crane answering all the purposes of a jib or swinging wall crane can be constructed on somewhat the same principle by pivoting one end of the crane and using a circular runway for the other end, the construction otherwise being the same.

The Billings & Spencer Cutting Off Tool.

An improved form of cutting off tool for use in lathes, having the tool proper detachably secured in a separable shank, is one of the latest products of the Billings & Spencer Company, Hartford, Conn. As may be seen from the illustrations the two parts of the shank are fastened together by two screws and the cutter has beveled top and bottom edges fitting in a dovetailed recess in the side of the holder. The screw at the cutter end of the holder has a $\frac{3}{8}$ -inch head and is set or released with a wrench and clamps the cutter rigidly, holding it fast while grinding. The other screw, near the rear end of the holder, has a slotted head and is countersunk so as not to interfere with the sliding of the shank into the tool post and serves merely to hold the segments together. The screw in the tool post not only clamps the holder, but binds the cutter with added firmness. The holder is drop forged of open hearth steel and is case hardened. The cutter is of the best tool steel. A drop forged wrench is furnished with each holder. The complete holder is 6 inches long, $1\frac{1}{4}$ inches wide and $\frac{1}{2}$ inch thick.

There will be no change this year in the rates for shipping coal to the Northwest by way of the lakes and to Chicago from the coal fields of western Pennsylvania, eastern Ohio and West Virginia. This was the decision reached at a recent meeting in Pittsburgh of the leading freight traffic officials of the railroads interested. About two years ago the coal carrying roads decided to increase the rates from the Pittsburgh district and since then the

shippers have been putting forth efforts to have the rates lowered to their old level. Many of the shippers felt confident of success and expected that the lower rate would become effective April 1. The traffic officials after discussing the matter decided that present conditions warranted a maintenance of the rates for another year at least.

The Shenango Furnace Company.

The transfer of the Oliver Estate interests in the Shenango Furnace Company, Pittsburgh, has provided an opportune time to reorganize the company. The capital stock has been increased to \$5,000,000 and the following officers have been elected: W. P. Snyder, president; C. H. Dyer, vice-president; Henry Irwin, Jr., secretary and treasurer. Walter A. Barrows, Jr., will be in charge of operations at the blast furnaces and ore mines and George D. Devitt will be superintendent in charge of the blast furnace department, while D. C. Peacock will be superintendent of mines. The company owns and operates four blast furnaces at Sharpville, Pa., has large ore properties on the Mesaba and Menominee ranges, owns 1300 acres of coal and coke lands in the Connellsville region and possesses valuable limestone properties. It also controls the Shenango Steamship Company, which has a large ore boat under construction by the Great Lakes Engineering Works, Detroit, Mich., that will be launched on February 17. The boat will be named W. P. Snyder, for the president of the company. The company's general offices are in the Frick Building, Pittsburgh.

Curve Wear of Rails on the Boston Elevated.—The *Street Railway Journal* for January 27 publishes an interesting article on the wear of steel rails on the curves in the subway and on the elevated structure of the Boston Elevated Railway Company. Few of the curves have large radii, 18 having less than 100 feet and 16 others less than 150 feet. One of the points of most severe wear is on the outer south half of the reverse curve entering Park Street Station, south bound, where the radius is



A Separable Cutting Off Tool Holder, Made by the Billings & Spencer Company, Hartford, Conn.

82 feet. At first ordinary commercial rails were laid on this curve, but an 85-pound rail which was laid March 13, 1902, was removed April 26, 1902, with its head considerably more than half worn off. A manganese steel rail was laid at this point on the latter date and it endured the traffic up to October 23, 1905, when it was removed for renewal. Manganese rails are being used on other points of severe wear on the subway and are giving good satisfaction, and from all appearances are good for a long period of service.

Production of Steel Rails and of Bessemer Ingots in 1905.

The production of Bessemer steel ingots and of all kinds of steel rails in the United States in 1905 has been ascertained by the American Iron and Steel Association. The total production of Bessemer steel ingots and castings for the year was 10,941,375 gross tons. The production of steel rails was 3,371,939 gross tons, of which 3,188,675 tons were Bessemer and 183,264 tons were open hearth rails. The production of iron rails amounted to 318 tons.

Bessemer Steel Ingots and Castings.

The production of 10,941,375 gross tons of Bessemer steel ingots and castings in 1905 is to be compared with 7,859,140 tons in 1904, an increase of 3,082,235 tons, or over 39 per cent. The production in 1905 was much the largest in our history, greatly exceeding that of 1902, the year of next largest production, when 9,138,363 tons were made. Of the total production last year 10,920,591 tons were made by the standard Bessemer process and 20,784 tons by the Tropenas and other modifications of the Bessemer process, employing small converters. Only acid Bessemer steel was produced in 1905. The following table gives the production in gross tons of Bessemer steel ingots and castings in the last four years by States. Of the production in 1905 22,103 tons were direct castings, against a similar production of 16,051 tons in 1904:

	1902.	1903.	1904.	1905.
Pennsylvania.....	4,209,326	3,909,436	3,464,650	4,491,445
Ohio.....	2,528,802	2,330,134	2,050,115	3,131,149
Illinois.....	1,443,614	1,366,569	1,257,190	1,651,250
Other States.....	956,621	986,690	1,087,185	1,667,531
Totals.....	9,138,363	8,592,820	7,859,140	10,941,375

There were no Clapp-Griffiths works in operation in 1905 and only two Robert-Bessemer plants were active. Twenty-five standard Bessemer plants were at work, as compared with 24 in 1904, and 13 Tropenas plants were running, against 11 in 1904. In addition one plant made steel by the Bookwalter process and four plants made steel in special Bessemer converters. All the small Bessemer works make a specialty of castings, although ingots are occasionally made. In 1905 three Bessemer converters were abandoned and dismantled, namely, two 5-gross-ton standard Bessemer converters at Pittsburgh and one 2-gross-ton Bookwalter converter at Reading, Pa.

While Pennsylvania is still far in the lead as a producer of Bessemer steel, Ohio made a great stride forward in 1905, producing nearly twice as much as Illinois, and nearly three-fourths of the output of Pennsylvania. The completion of the Bessemer plant of the Youngstown Sheet & Tube Company will further increase the Ohio tonnage.

Bessemer and Open Hearth Steel Rails.

The production of all kinds of rails reached its maximum in 1905, amounting to 3,372,257 gross tons, against 2,284,711 tons in 1904, an increase of 1,087,546 tons, or 47.6 per cent. The year of next largest production was 1903, when 2,992,477 tons were made. The increase in 1905 over 1903 amounted to 379,780 tons, or over 12 per cent. Rails rolled from purchased blooms, crop ends, "seconds" and rerolled or renewed rails are included.

The following table gives the production of all kinds of rails in 1905 according to the weight of the rails per yard. Street rails are included:

	Under 45 lbs.	45 lbs. and less than 85.	85 lbs. and over.	Total.
Bessemer rails	209,853	1,468,123	1,510,699	3,188,675
Open hearth rails..	16,409	131,501	35,354	183,264
Iron rails.....	318	0	0	318
Total.....	226,580	1,599,624	1,546,053	3,372,257

In the following table the production of steel rails in Pennsylvania is separated from that of the other States:

	Bessemer.	Open hearth.	Total.
Pennsylvania	1,095,154	18,687	1,113,841
Other States	2,093,521	164,577	2,258,318
Total.....	3,188,675	183,264	3,371,939

Twenty-four plants in 12 States rolled or rerolled rails in 1905, as follows: New York, 1; Pennsylvania, 5;

Maryland, 3; West Virginia, 1; Georgia 1; Alabama, 3; Ohio, 4; Illinois, 2; Wisconsin, 1; Colorado, 1; Washington 1, and California, 1. The production of Bessemer steel rails in 1905 amounted to 3,188,675 gross tons, against 2,137,957 tons in 1904, an increase of 1,050,718 tons, or over 49 per cent. In the following table the production of Bessemer steel rails is given by States from 1902 to 1905 in gross tons:

	1902.	1903.	1904.	1905.
Pennsylvania.....	1,148,425	1,186,284	801,657	1,095,154
Other States.....	1,786,967	1,760,472	1,336,300	2,093,521
Total.....	2,935,392	2,946,756	2,137,957	3,188,675

In addition to Pennsylvania, the States which made Bessemer rails in 1905 were New York, Maryland, West Virginia, Georgia, Ohio, Illinois, Wisconsin, Colorado and Washington. The production of Bessemer steel rails by the makers of Bessemer steel ingots, included above, amounted to 3,135,729 tons in 1905, against 2,084,688 tons in 1904, an increase in 1905 of 1,051,041 tons, or over 50 per cent. In no preceding year had the production of Bessemer steel rails by the makers of domestic ingots exceeded 2,900,000 tons. The following table gives the total production of all kinds of Bessemer steel rails from 1902 to 1905, the rails rolled by makers of domestic ingots being separated from those rolled by companies which did not operate Bessemer converters. In 1905 about 101,000 tons of renewed or rerolled Bessemer steel rails were produced by makers of domestic ingots. These rails are included below:

	1902.	1903.	1904.	1905.
By makers	2,876,293	2,873,228	2,084,688	3,135,729
By all others.....	59,099	73,528	53,269	52,946
Total.....	2,935,392	2,946,756	2,137,957	3,188,675

The total production of open hearth steel rails in 1905 was 183,264 tons, against 145,883 tons in 1904, 45,054 tons in 1903, 6029 tons in 1902, 2093 tons in 1901 and 1333 tons in 1900. The maximum production of open hearth rails was reached in 1905; the year of next highest production was 1904. Alabama rolled almost all of the open hearth rails that were rolled in 1905 and 1904, Pennsylvania rolling the remainder in 1905 and Pennsylvania and Colorado in 1904.

The production of iron rails in 1905 was 318 tons, all rolled in Alabama, Ohio and California, and all weighing less than 45 pounds to the yard. In 1904 the production was 871 tons.

The Foundry Trade School.—The Winona Technical Institute, Indianapolis, Ind., is proceeding with the organization of a school for foundrymen, in accordance with action taken by the National Founders' Association at its last annual convention. The association voted to give the school complete equipment and to maintain from its treasury 30 scholarships each year. The school will be operated in connection with the Institute and will undertake to teach the best methods prevailing in the best shops. A foundry, 58 x 90 feet, occupies a portion of one building and in another room is a cupola 17 inches x 23 feet. In addition to class instruction a feature of the school work will be excursions to commercial establishments that students may obtain practical insight of what is required of them in the industrial world, and on these tours the students will have full opportunity of inquiring into methods of operation. The committee selected by the National Founders' Association to direct the work, consisting of W. S. Gilbert of the Buckeye Foundry, Cincinnati, Ohio; W. H. Pfahler of Philadelphia, and John Ketcham of Indianapolis, recently visited the school and took steps toward having this new department in readiness for opening by August 1, 1906.

It has been reported in the daily papers in the past week that the Pennsylvania Railroad has decided to eliminate the Horseshoe Curve in the Alleghany Mountains by constructing a 9-mile tunnel at a cost of \$15,000,000. From the engineering department of the road the statement is made that the plan has been under consideration for 20 years, but nothing definite has been decided; that while such a tunnel would greatly reduce the operating expenses it would cost too much.

The Production of Pig Iron in 1905.

General Manager James M. Swank of the American Iron and Steel Association has gathered from the manufacturers complete statistics of the production of pig iron in the United States in 1905. The total production of all kinds of pig iron in 1905 was 22,992,380 gross tons, against 16,497,033 tons in 1904, 18,009,252 tons in 1903 and 17,821,307 tons in 1902. The production of 1905 was not only much the largest in the history of the trade, being nearly 5,000,000 tons in excess of that for the previous record year 1903, but it was 6,495,347 tons or 39 per cent. more than that for 1904, a remarkable gain in a single twelve-month. The production in the second half of 1905 was 666,030 tons more than that of the first half. The output by States was as follows:

Total Production of Pig Iron by States.

Production—Gross tons of 2,240 pounds.
(Includes spiegeleisen.)

States.	First half of 1905.	Second half of 1905.	Total for 1905.
Massachusetts, Connecticut..	7,636	8,351	15,987
New York.....	550,208	647,860	1,198,068
New Jersey.....	165,991	145,048	311,039
Pennsylvania.....	5,228,691	5,352,436	10,579,127
Maryland.....	156,334	175,762	332,096
Virginia.....	240,672	269,538	510,210
North Carolina, Georgia and Texas.....	25,752	12,947	38,699
Alabama.....	743,547	860,515	1,604,062
West Virginia.....	149,016	149,163	298,179
Kentucky.....	32,793	30,942	63,735
Tennessee.....	195,757	176,935	372,692
Ohio.....	2,181,058	2,405,052	4,586,110
Illinois.....	979,157	1,055,326	2,034,483
Michigan.....	147,953	140,751	288,704
Wisconsin and Minnesota...	184,234	167,181	351,415
Missouri, Colorado, Oregon and Washington.....	176,376	231,398	407,774
Totals, 1905.....	11,163,175	11,829,205	22,992,380
Totals, 1904.....	8,173,438	8,323,595	16,497,033

The production of coke and anthracite pig iron by States was as follows:

Production of Anthracite and Coke Pig Iron.

States.	First half of 1905.	Second half of 1905.	Total for 1905.
New York.....	549,204	647,860	1,197,064
New Jersey.....	165,991	145,048	311,039
Pennsylvania.....	5,224,806	5,351,027	10,575,833
Maryland.....	156,108	175,762	331,870
Virginia, North Carolina and Georgia.....	259,399	268,637	528,036
Alabama.....	729,845	848,669	1,578,514
West Virginia.....	149,016	149,163	298,179
Kentucky.....	32,793	30,588	63,381
Tennessee.....	195,180	175,037	370,217
Ohio.....	2,180,558	2,401,377	4,581,935
Illinois.....	979,157	1,055,326	2,034,483
Michigan and Wisconsin...	182,415	149,642	332,057
Minnesota, Missouri and Col- orado.....	188,191	248,653	436,844
Totals, 1905.....	10,992,683	11,646,789	22,639,452

The production of charcoal iron by States is given in the following table:

Production of Charcoal Pig Iron by States.

States.	First half of 1905.	Second half of 1905.	Total for 1905.
Massachusetts, Connecticut and New York.....	8,640	8,351	16,991
Pennsylvania.....	1,885	1,409	3,294
Maryland and Virginia.....	1,125	946	2,071
Alabama.....	13,702	11,846	25,548
Georgia, Texas, Kentucky and Tennessee.....	6,703	15,154	21,857
Ohio.....	500	3,675	4,175
Michigan.....	104,584	105,989	210,573
Wisconsin, Missouri, Oregon and Washington.....	33,373	35,046	68,419
Totals, 1905.....	170,512	182,416	352,928
Totals, 1904.....	213,356	124,173	337,529

The production of all kinds of pig iron in Pennsylvania and Ohio by districts is shown in the table below:

	First half of 1905.	Second half of 1905.	Total for 1905.
Pennsylvania:			
Lehigh Valley.....	316,721	309,579	626,300
Schuylkill Valley.....	290,266	263,428	553,694
Lower Susquehanna Valley	282,967	381,812	664,779
Juniata Valley.....	107,723	102,046	209,769
Allegheny County.....	2,716,668	2,694,222	5,410,890
Shenango Valley.....	882,834	906,182	1,789,016
Miscellaneous bituminous..	627,627	693,758	1,321,385
Charcoal.....	1,885	1,409	3,294

Ohio:			
Mahoning Valley.....	855,336	869,591	1,724,927
Hocking Valley and lake counties.....	558,092	742,355	1,300,447
Miscellaneous bituminous..	594,140	603,898	1,198,038
Hanging Rock bituminous..	172,990	185,533	358,523
Hanging Rock charcoal...	500	3,675	4,175

The production of Bessemer and low phosphorus pig iron by States and by the various districts in Pennsylvania and Ohio is shown in the following table. The total for Pennsylvania was 5,939,042 tons and for Ohio 3,207,793 tons:

Production of Bessemer and Low Phosphorus Pig Iron.

	First half of 1905.	Second half of 1905.	Total for 1905.
New York.....	239,525	297,412	536,937
Pennsylvania:			
Lehigh Valley.....	37,301	29,119	66,420
Schuylkill Valley.....	18,234	26,698	44,932
Lower Susquehanna Valley and Juniata Valley....	215,057	300,570	515,627
Allegheny County.....	1,865,597	1,783,150	3,648,747
Shenango Valley.....	585,501	536,409	1,121,910
Miscellaneous bituminous..	231,288	307,118	538,406
Maryland.....	156,108	175,762	331,870
West Virginia and Tennessee	153,857	161,843	315,700
Ohio:			
Mahoning Valley.....	593,859	619,157	1,213,016
Hocking Valley.....	.....	.....	.....
Lake counties.....	417,023	587,271	1,004,294
Hanging Rock bituminous..	59,736	75,738	135,474
Miscellaneous bituminous..	435,716	419,293	855,009
Illinois.....	796,763	859,517	1,656,280
Michigan and Wisconsin...	36,629	55,044	91,673
Colorado.....	139,954	187,867	327,821
Totals.....	5,985,148	6,421,968	12,407,116

The production of basic pig iron in 1905, not including charcoal of basic quality, was 4,105,179 tons, against 2,483,104 tons in 1904, an increase of 1,622,075 tons, or over 65 per cent. The production of basic pig iron by States last year was as follows:

Production of Basic Pig Iron, Not Including Charcoal Iron.

	First half of 1905.	Second half of 1905.	Total for 1905.
New York and New Jersey..	92,939	79,287	172,206
Pennsylvania:			
Allegheny County.....	753,449	784,460	1,537,909
Other counties.....	657,930	762,167	1,420,097
Virginia and Alabama.....	201,524	246,963	448,487
Ohio, Illinois and Missouri..	260,750	265,730	526,480
Totals.....	1,966,592	2,138,587	4,105,179

The following table is interesting as showing the growth of pig iron production in the various States in recent years:

Production of All Kinds of Pig Iron from 1902 to 1905.

States.	Gross tons of 2,240 pounds.			
	1902.	1903.	1904.	1905.
Massachusetts.....	3,360	3,265	3,149	15,987
Connecticut.....	12,086	14,501	8,922	.....
New York.....	401,369	552,917	605,709	1,198,068
New Jersey.....	191,380	211,667	262,294	311,039
Pennsylvania.....	8,117,800	8,211,500	7,044,321	10,579,127
Maryland.....	303,229	324,570	293,441	332,096
Virginia.....	537,216	544,034	310,526	510,210
North Carolina, Georgia and Texas	35,410	87,255	75,686	38,699
Alabama.....	1,472,211	1,561,398	1,453,513	1,604,062
West Virginia.....	183,005	199,013	270,945	298,179
Kentucky.....	110,725	102,441	37,106	63,735
Tennessee.....	392,778	418,368	302,096	372,692
Ohio.....	3,631,388	3,287,434	2,977,929	4,586,110
Illinois.....	1,730,220	1,692,375	1,655,991	2,034,483
Michigan.....	155,213	244,709	233,225	288,704
Wisconsin and Min- nesota.....	273,987	283,516	210,404	351,415
Missouri, Colorado and Washington..	269,930	270,289	151,776	407,774
Totals.....	17,821,307	18,009,252	16,497,033	22,992,380

The production of spiegeleisen and ferromanganese in 1905 was 289,983 tons, against 219,446 tons in 1904, an increase of 70,537 tons. The production of ferromanganese alone in 1905 was 62,186 tons, against 57,076 tons in 1904. One company produced 1243 tons of ferrophosphorus in 1905, against a similar production of 946 tons in 1904.

It is said to be possible to make a manganese steel armor plate by the casting process which is in every way equal to the best Krupp cemented plates. This is the more remarkable in that, as the process of casting is so very simple as compared with those heretofore in use for the manufacture of armor plate, the improvement is seen to consist largely in eliminating the features of

the process which cost much time and money for their fruition and in replacing the very complicated with the simple.

Iron and Steel Exports and Imports in 1905.

The December report of the Bureau of Statistics of the Department of Commerce and Labor has been received and consequently the total figures for the calendar year 1905 are available. From these figures tables have been made up as given below, covering the usual details as to quantities. It will be seen that the total exports of commodities for which quantities are given are placed by the bureau for the year at 1,009,290 gross tons. We stated in these columns last week that the shipments to foreign countries in 1905 of the United States Steel Corporation alone had aggregated 1,052,000 gross tons. As a number of other manufacturers must have exported iron and steel during the year, we have quite a discrepancy in the figures. This is explained, as intimated last week, by the fact that in some important lines of iron and steel exports the Bureau of Statistics does not give the tonnage figures. An example of this kind is to be found in the export trade in merchant pipe. The quantity of such pipe exported is quite large, but its tonnage is not given. The value of "pipes and fittings" exported in 1905 is placed at \$8,293,816, against \$7,303,900 in 1904. The quantity figures which are given are nevertheless worthy of scrutiny because they afford an excellent basis of comparison from month to month or from year to year.

Taking the quantity figures for exports, we have the following table:

Commodities.	December.		Twelve months.	
	1905.	1904.	1905.	1904.
Gross tons.	Gross tons.	Gross tons.	Gross tons.	Gross tons.
Pig iron.....	3,442	3,141	49,221	49,025
Scrap	751	1,361	7,966	26,785
Bar iron.....	2,738	2,295	32,025	29,582
Wire rods.....	719	2,028	6,514	20,073
Steel bars.....	750	2,562	19,890	25,895
Billets, ingots, blooms.....	34,606	18,162	237,638	314,324
Hoop, band and scroll.	604	432	4,426	3,435
Iron rails.....		3		1,405
Steel rails.....	21,717	18,996	295,023	414,845
Iron sheets and plates	801	476	8,004	4,727
Steel sheets and plates.	5,989	3,482	67,093	50,477
Tin plates andterne plates	443	539	7,941	7,898
Structural iron and steel	10,765	5,741	83,193	55,514
Wire	12,764	10,200	142,609	118,612
Cut nails.....	394	657	7,890	9,273
Wire nails.....	2,698	4,368	35,836	32,793
All other, including tacks	256	351	4,021	3,047
Totals.....	99,437	74,794	1,009,290	1,167,710

The exports in December show a slight reduction on the movement in November, but were larger than in other preceding months. In November the exports reached 102,917 tons, in October 89,728 tons, in September 85,969 tons, in August 82,317 tons and in July 67,071 tons.

The following table shows the imports of iron and steel in the lines for which quantities are given in the month and 12 months ending with December:

Commodities.	December.		Twelve months.	
	1905.	1904.	1905.	1904.
Gross tons.	Gross tons.	Gross tons.	Gross tons.	Gross tons.
Pig iron.....	26,575	5,815	212,465	79,500
Scrap	7,991	1,032	23,731	13,461
Bar iron.....	3,147	2,112	37,294	20,905
Rails	574	332	17,278	37,776
Hoop, band and scroll.	1,965	190	4,772	2,135
Billets, slabs, bars, &c., steel in forms n.e.s.	1,900	530	14,642	10,807
Sheets and plates....	221	158	2,336	4,165
Tin plates andterne plates	3,308	5,706	65,740	70,652
Wire rods.....	1,562	1,251	17,616	15,313
Wire and articles made from	402	310	3,978	3,956
Structural iron and steel	3,595	220	16,147	7,203
Chains	39	11	215	358
Anvils	9	29	195	167
Totals.....	51,288	17,696	416,409	266,398

The figures for the month of December show quite an increase over the same month of the previous year, as

well as over all the immediately preceding months. While the imports in December totaled 51,288 gross tons the imports for November were 33,904 tons, in October 35,801 tons, in September 43,264 tons, in August 39,504 tons and in July 36,444 tons. The heavy increase in December was in importations of pig iron, scrap, steel billets and structural shapes. Special influences have accounted for the increased imports in all these lines. In tin plates, on the other hand, importations are steadily diminishing.

The total imports of iron ore for the year were 845,651 gross tons, against 487,613 tons in 1904. The exports of iron ore in 1905 were 208,058 gross tons, against 213,865 tons in 1904.

The total value of all exports of iron and steel and manufactures thereof, not including ore, in 1905, was \$142,928,513, against \$128,455,613 in 1904 and \$99,035,865 in 1903.

The total value of imports of iron and steel and manufactures thereof, not including ore, in 1905 was \$26,392,728, against \$21,621,970 in 1904 and \$41,255,864 in 1903.

The following details of values of exports of manufactures of iron and steel for the calendar years 1905 and 1904 will be of interest to many of our readers:

Commodities.	1905.	1904.
Builders' hardware.....	\$5,789,274	\$5,553,473
Saws	594,364	570,056
Tools, n.e.s.....	6,076,415	5,053,084
Car Wheels.....	174,284	175,947
Castings, n.e.s.....	1,595,711	1,372,314
Cutlery, table.....	72,423	101,268
Cutlery, other.....	448,718	333,824
Firearms	1,687,029	1,486,151
Cash registers.....	2,210,990	1,871,100
Electrical machinery.....	7,409,242	6,675,766
Laundry machinery.....	646,654	512,542
Metal working machinery.....	5,625,044	3,483,232
Printing presses.....	1,500,603	1,450,993
Pumps	3,737,774	2,733,625
Sewing machines.....	6,474,992	6,019,161
Shoe machinery.....	1,383,005	1,240,096
Fire engines.....	14,479	5,062
Locomotives	5,573,080	4,697,340
Stationary engines.....	1,184,784	1,099,690
Boilers and engine parts.....	2,486,589	2,003,323
Typewriting machines.....	5,102,980	4,138,651
Wood working machinery.....	853,426	628,714
All other machinery.....	25,512,579	22,918,952
Safes	299,711	242,815
Scales and balances.....	732,971	608,513
Stoves and ranges.....	1,019,757	810,971

Lake Copper Mine Equipment.—The 10,000 horsepower electrical power plant of the Calumet & Hecla Mining Company, which has been under construction on Lake Linden, Mich., is nearing completion and will be turned over in the presence of the officials of that company and a party of engineers of the General Electric Company about February 15. The scheme for the ultimate complete electrification of the Calumet & Hecla is a large one and includes not only hoisting and underground mine operations, but tremendous pumping units for handling the entire mine water of the company, most of which is collected at about 3000 feet from surface. The present plant will do all mine work except air compression and hoisting. The company has in consideration other electrical operations, notably a change from stamps to rolls, and its construction work in these lines during the coming few years will be watched with the widest interest. Tamarack and Ahmeek are also planning an important pumping and other electrical installations. There is a feeling throughout the Lake copper region that its machine and power plants are now on the eve of changes of much magnitude. The district has never been behind in the adoption of new and improved devices, and it is taking hold of the questions arising from the perfection of electrical power in a way to show that its reputation for progress is in no ways diminished.

The Firth-Sterling Steel Company, Pittsburgh, works at Demmler, Pa., has awarded the contract for the open hearth steel furnaces and equipment of its new projectile plant, to be erected at Giesboro Point, District of Columbia, to William Swindell & Brothers, engineers and contractors, German National Bank Building, Pittsburgh. This new plant will be located within the city limits of Washington, D. C., and all the furnaces will operate by producer gas, the contract including a gas plant of sufficient capacity for this purpose.

THE IRON AGE

1855-1906.

New York, Thursday, February 8, 1906.

DAVID WILLIAMS COMPANY,	- - - - -	PUBLISHER
CHARLES KIRCHHOFF,	- - - - -	
GEO. W. COPE,	- - - - -	} EDITORS
A. L. FINDLEY,	- - - - -	
RICHARD R. WILLIAMS,	- - - - -	HARDWARE EDITOR

A Remarkable Building Movement.

The recent computation showing that 200,000 tons of structural steel will be required for buildings to be erected in New York the coming season and for which detail plans have already been made indicates how large a factor such operations are in the present prosperity of the iron trade. This tonnage represents projects on which contractors' bids have been asked and that are expected to be carried out unless interrupted by financial or industrial developments calculated to check all business. It is entirely reasonable, in view of these figures, to look for the placing of 300,000 tons of structural steel for work in New York alone before the end of the year. The total placed in the year 1905 for use in New York City has been closely calculated and is found to be somewhat above 200,000 tons.

A half million tons of structural steel sold in two years for new buildings in the metropolis alone is so strikingly in line with what the bolder prophets have been saying of the future of steel as to arrest attention. It recalls the phase of the subject that elicited special comment in a meeting of steel manufacturers in a New York office building. Industrial conditions at the time were not as promising as now, but there were optimists in the group, and one of these expressed strong faith in the continued expansion of steel consumption. Calling attention to the hundreds of low and antiquated buildings in lower New York visible from the meeting room, he averred that the tearing down and rebuilding in Manhattan alone in the succeeding 20 years would mean the consumption of an enormous tonnage of steel, and when taken in connection with like operations throughout the country warranted the brightest expectations for the iron trade.

The building movement that was a feature of several of the years following the panic of 1893 was due to causes far different from those prompting similar investments now. The price of steel had sunk to a point never touched before or since. It was the day of 2-3 cent a pound and less for steel billets, and so keen was the competition for structural business that one large building in the Central West was erected with shapes costing \$17 a net ton at Pittsburgh mill. Other factors that contributed to the same building movement were the cheapness of labor and of real estate and the attractiveness of buildings as an investment at a time when securities were groveling in the lowest depths and were shunned by conservative capital everywhere. Contrasting in every particular with the above mentioned conditions is the wave of new construction now running toward full tide throughout the country. Structural steel sells at nearly twice the extreme low price touched in the nineties, and yet in comparison with many products now and with its own high records of boom times it is at a moderate level. Real estate is high, and securities, while high priced, are still attractive as compared with the returns of city buildings, based on present costs for labor, ground and materials. Instead of being

a badge of industrial distress, as it was ten years ago, the present building movement results from an overflowing prosperity that has accumulated unprecedented savings bank deposits and piled up the surplus of the wealthy beyond any dream of a decade ago. The new buildings of to-day are going up because the growth of the great cities of the country requires the tearing down of the old, to be replaced by what is better and larger.

While the amount of structural steel to be required in New York this year is remarkable, representing in part perhaps the accumulated projects of recent years in which strikes have upset all calculations in the building trades, recent reports from other cities, notably New Orleans, Chicago, San Francisco, Pittsburgh and Cleveland, indicate that 1906 will be a year of great activity, in most cases exceeding the great record of 1905. In New Orleans, for example, 25,000 tons will be required for the carrying out of plans now well along. What this amount of steel represents is indicated in part by the statement that the rebuilding movement in Baltimore, in replacement of the more prominent of the buildings consumed in the fire of 1904, has only taken so far about 30,000 tons of steel. What the 300,000 tons will mean that is likely to be ordered for new construction in New York this year can be comprehended in part by one who has traveled about New York in recent months and noted how streets are broken in upon by erecting operations that can literally be counted by hundreds.

Relative Foundry Iron Prices at Chicago.

The disparity in the Chicago delivered quotation on Northern and Southern foundry pig iron is one of the anomalies of the iron and steel situation brought about by the abnormal activity now enjoyed by the trade. Since November Northern operators have maintained No. 2 foundry on a basis ranging from \$1 to \$1.15 above the same Southern grade and present market conditions favor an increase of this spread on account of the weakening of Southern quotations. The theoretical spread between the values of these brands has been established at 50 cents a ton in the Chicago market, but a reference to the average prices ruling in the past few years at that point shows that this spread has not often been maintained. During 1904 the market showed a decided tendency to wipe out this disparity entirely, but the vagaries of last year's trade greatly favored the product of Northern furnaces, as shown by the table below, which is based on average prices for the years specified:

	Northern No. 2.	Southern No. 2.	Spread.
1902.....	\$20.50	\$20.10	\$0.40
1903.....	18.88½	18.31½	0.57½
1904.....	14.04¾	13.92½	0.12½
1905.....	17.30¾	16.66½	0.63¾

Although Northern grades have sold uniformly above Southern at Chicago, in November, 1902, conditions were reversed, when the average for the latter was \$24, as compared with \$23 for Northern. In the following month prices for the two dropped to an even basis, yet conditions were such that this abnormal condition was maintained for several months. In the closing months of 1904 the Southern product was again favored to the extent of 30 to 60 cents a ton, but conditions were speedily reversed early in 1905. The present disparity, as well as that of the closing months of last year, is ascribed to the absence of Valley furnaces as factors in the foundry iron trade operating on Bessemer for steel works requirements, and much of the malleable Bessemer previously furnished by these furnaces for Western foundries is now being supplied by Lake Erie stacks as well as those in the Chi-

chicago district. The withdrawal of the Illinois Steel Company as a producer of foundry iron has also been a potent factor in bringing about present conditions. The reduction in the spread of average prices in 1904 to 12¼ cents was largely due to the blowing in of new merchant stacks at Detroit and Toledo, who sought to establish a market for their iron in the West, and Valley furnaces with little or no sale for their Bessemer iron turned to foundry and malleable.

In this connection it is also interesting to note the reduction in the spread between heavy cast scrap and Northern No. 2 foundry pig iron at Chicago in the past four years. The Chicago market has always been plentifully supplied with old material, and the foundry man has found it profitable to vary his charge as pig iron was high and scrap relatively low, or vice versa. That conditions have favored the use of a high percentage of pig iron is shown below:

	Northern No. 2.	No. 1 heavy cast.	Spread.
1902.....	\$20.50	\$15.03	\$5.47
1903.....	19.99½	14.74½	4.14
1904.....	14.04¼	10.95½	3.08¾
1905.....	17.30¼	13.49½	3.81¾

The light demand for soft iron containing from 3 to 4 per cent. silicon used in carrying a heavy scrap burden is indicative of the foundry men's preference for pig metal, although an increase in the spread due to the lowering of scrap since the first of the year will be favorable to the disposition of these softer grades, of which there has been quite an accumulation in furnace yards.

Open Hearth Practice Getting the Preference.

The exhaustive report of the special committee on steel rails, presented at the recent annual meeting of the American Society of Civil Engineers, which recommended revised specifications for Bessemer and open hearth sections, only briefly touched upon the relative merits of rails manufactured from these two kinds of steel, but the conclusions reached after studying the results obtained from basic rails point to their giving better service than those rolled of Bessemer steel.

Widespread interest has been manifested by railroad engineers in the introduction of the basic product by the Tennessee Coal, Iron & Railroad Company, and the Bessemer rail makers with great investments at stake in manufacturing and ore properties have displayed the keenest interest in the experiments carried on by many roads throughout the country where the rails have been laid side by side to ascertain their relative wearing qualities. While it is true that the use of the basic rail in this country has extended over only a comparatively short period—too brief, in fact, to arrive at any definite conclusions—nevertheless the investigation of this committee is of the utmost importance and value and the report on the subject follows:

Your committee has studied the results obtained from basic open hearth steel rails, and, while their use has not extended over many years, at the same time the evidences point to their giving better service than the Bessemer rails. This is strikingly demonstrated by certain experimental very high carbon ones laid on the lines of the Pennsylvania Railroad. It must be understood that the physical differences of the two steels are not entirely due to their chemical composition, as it is a well-known metallurgical fact that steel made by the basic open hearth process possesses characteristics of its own.

Notwithstanding the comparatively limited distribution of open hearth rails on roads throughout the country, Northern rail makers realize that the tendency is strongly toward the extended use of the basic section from the glowing reports received from maintenance of way departments making experiments along this line, and the report of this special committee only strengthens the

conclusions reached some time ago by those in close touch with the situation.

That the United States Steel Corporation has decided to erect a rail mill at its new plant near Chicago, where steel operations will be limited to basic practice entirely, indicates its recognition of this new factor in the steel trade. The large investments represented in the Bessemer works from which the rail mills in the North derive their steel supply, to say nothing of the Bessemer ore holdings which eliminate other processes, make the adoption of the basic practice at these plants not only improbable but impossible. The development of the basic rail in the South was the only solution of the manufacture of this product in that section of the country, on account of the nature of the ore to be had. In the North, however, the abundance of Bessemer ores in the Lake Superior region, together with the uncertainties of practice in the open hearth when most of the Northern rail mills were built, naturally led the way to the use of steel made by the pneumatic process.

The preference of other steel users for open hearth material, which is becoming more insistent every day, was clearly manifested during the depression in 1904, when open hearth works for the most part were operated at their capacity, while the Bessemer plants were largely idle. During periods of great activity, such as the present, when consumers despite their preferences will accept steel of either grade, the consumption of both is limited only by the productive capacity. That only one Bessemer plant is included in the large number of steel works projected and under way shows the producers' full appreciation of consumers' demands and the necessity of meeting changing conditions.

Public Interest in Forest Preservation.

The steadily increasing value of water power as a source of energy for industrial purposes has begun to play its part in the movement for the preservation of the forests. The lumbermen have long been prodigal in their operations, aiming solely at getting out the timber at the minimum of cost, which meant razing the forests almost to the last sapling. Forest growth has been wasted which, if permitted to stand, would have afforded a covering almost sufficient to serve as a safeguard of the waters, or at any rate to bridge over until new growth filled the intermediate spaces of bared ground. When the forests seemed inexhaustible such devastation was but natural. To-day thought is directed to the future—of the water supply from the standpoint of the user of this source of power and of the woodlands from the standpoint of the lumberman, who now sees that if he is to make a profit in the future he must take out the fittest of the trees and leave the rest to grow up under the better conditions secured by the removal of more powerful neighbors.

The public has an interest in this work measured by the rapidly increasing cost of lumber for all purposes. In the West the timber of the Pacific Coast is taking a place in competition with native woods, for the increasing scarcity of the latter has brought an advance in prices to offset the cost of freight from the Western seaboard. But from the East the Oregon and other timbers of the Pacific Slope are excluded by the cost of freight, and the dealers in lumber predict that this exclusion will continue, excepting in the case of woods for certain limited purposes, until the isthmian canal is opened. This but emphasizes the necessity of a careful preservation of the Eastern forests. The reservations established by the

Government, embracing great areas of forest lands patrolled and protected at Government expense, will assist to some extent in the preservation of the water power of the rivers. Without the forests at the sources of rivers and their tributaries the flow must become more intermittent, with alternate floods and droughts rather than the natural, even flow necessary for a steady supply of power for manufacturing operations.

But the Government cannot do it all. By far the greater area of forest lands must be utilized for commercial purposes. Their timber must be cut off to supply the lumber trade and to furnish the pulp which enters into the manufacture of paper. The remedy lies largely with the private owners, who have an example in the excellent work in reforestation that has been done on the Biltmore estate in North Carolina. The French Broad River with its tributaries above Asheville, N. C., drains the Biltmore estate and the fact that, as statistics show, the French Broad varies less than any other stream in the South Atlantic States is attributed to the protection the river receives from intelligent reforestation.

Perhaps it may be necessary at some time to enact forestry laws similar to those of Europe, which for the common weal prohibit the cutting of any tree on private land without the permission of the Government forester. But it is more likely that the movement already started by some owners of timberlands, to cull trees with discrimination, leaving standing wherever possible everything which is not required and to plant seedlings in place of matured trees as the latter are removed, will solve the great problem. The agitation which has been going on for some years, and which is growing, backed by the Forest Service of the Agricultural Department at Washington, is proving an efficient campaign of education and one that is already producing most encouraging results.

Pig Iron and Bessemer Steel in 1905.

A number of interesting comparisons and deductions may be made in connection with the figures given elsewhere in this issue, showing the production of pig iron, rails and Bessemer steel ingots in 1905. At this time we call attention to but two or three points that are more obvious:

The increase in the production of Bessemer and basic pig iron in 1905 over the records for 1904 is noteworthy, the combined increases of steel-making irons being 4,930,532 tons, as compared with 1,564,815 tons increase for all other descriptions—foundry, forge, malleable Bessemer, spiegel, ferro-manganese, &c. Thus the increase in steel-making pig iron was about $3\frac{1}{4}$ times the increase in all other irons. The table below shows the production of Bessemer and basic pig irons, and in a separate item all other kinds of pig iron, in 1905 and the two preceding years, in gross tons:

	1903.	1904.	1905.	Incr., 1905 over 1904.
Bessemer	9,989,908	9,098,659	12,407,116	3,308,457
Basic	2,040,726	2,483,104	4,105,179	1,622,075
Foundry forge, &c. . .	5,978,618	4,915,270	6,480,085	1,564,815

The percentage increase in basic pig iron production is noteworthy, as is the fact that in Bessemer iron the increase in 1905 over 1904 was equal to that of all other kinds of pig iron combined.

The percentage of the pig iron output of last year contributed by the Southern States is a matter of interest, in view of the prominence given that section in much recent writing concerning the iron trade. The production of Virginia, North Carolina, Georgia, Texas, Alabama, Kentucky and Tennessee was 2,589,398 tons, or 11.2 per

cent. of the total, as against 2,178,927 tons or 13.2 per cent. of the total in 1904. In 1901, the first year of the present decade, the Southern States made 13.2 per cent. of the total pig iron, or exactly the same percentage as in 1904. The marked increase in the production of New York is significant—from 605,709 tons in 1904 to 1,198,068 tons last year, or nearly 100 per cent., due to the important additions to steel-making iron as well as foundry iron capacity in the Buffalo district.

The statistics of open hearth steel production in 1905 are not yet available but the figures for Bessemer ingot production tally with the Bessemer pig iron returns and emphasize the marked expansion in steel lines that was the feature of the trade last year. If to the increase of 1,622,075 tons in basic pig iron production in 1905 over 1904 be added the increased tonnage of scrap charged in basic open-hearth furnaces last year, it is entirely probable that the official figures will show a production of basic and acid open-hearth ingots and castings in 1905 of more than 8,000,000 tons, as compared with 5,908,166 tons in 1904. The production of basic open-hearth steel in 1904 was 5,007,448 tons.

The exact returns for Bessemer steel and the basic pig iron production in 1905 point to a total production of all kinds of steel ingots and castings in that year of not far from 19,000,000 tons. The previous high record was made in 1902—14,947,250 tons; in 1903 the total was 14,534,978 tons and in 1904 it was 13,859,887 tons. The statistics for 1905 certainly point to a vitality of the Bessemer process that would scarcely be expected in view of the sweeping statements frequently met with concerning the remarkable advance in open hearth. The response of the Bessemer works of the country to the tremendous demand made upon steel manufacturers last year is a phenomenon that may well arrest attention.

CORRESPONDENCE.

Electro Galvanizing.

To the Editor: Having noticed with interest the article in your paper written by Henry I. White, we have also read the letter from Ed. Mowry in your edition of January 25. The whole seems to be of sufficient interest to the trade to have real facts brought before them, and not only a general explanation by simply saying that the hot galvanizing is superior.

The reference to a few samples galvanized by the electro process, and tested by exposure, does not show anything, as it is certainly possible that such samples were carelessly galvanized, and one test of such kind should not be considered as sufficient proof that experiments made by three different scientific men are wrong. At the time referred to, the cold galvanizing was in its infancy, and the application of zinc on some articles was attended with more or less difficulties, which have been overcome entirely to-day. For your own satisfaction and eventually for any other use you may see fit to make of them we take the liberty to send you a few samples galvanized by the hot and cold process, described as follows:

Sample No. 1. Barb wire, hot galvanized, exposed for two years, very badly rusted.

No. 2. Hot galvanized wire, used for holding up vines, exposed five years, entirely rusted to pieces.

No. 3. Cold galvanized bent wire, 3-16 inch thick, used for protecting flower beds, ends being about 6 inches in the ground for about one year, in absolutely perfect order.

No. 4. Cold galvanized $\frac{1}{2}$ inch round bar, used for fence purposes, exposed two and three-quarter years, being about 10 inches in the ground, having the possible lightest coat, applied in eleven minutes, especially for testing purposes, in absolutely perfect order.

No. 5. Casting, lying around in factory for over five years, always exposed to damp air, acid fumes, &c., in perfect order.

No. 6. Piece of pipe, galvanized about eight months ago, exposed to acid fumes for about two months and for six months exposed on window sill to acid fumes, rain, snow, &c., in absolutely perfect order. This piece has been bent; no crack is

shown and there is no sign of rust, which shows that the zinc is absolutely amalgamated with the steel.

The above mentioned samples, Nos. 1 to 4 inclusive, are taken from the premises; any one interested can see the bulk of the material on the spot.

By the hot galvanizing process there is no way of regulating the thickness of coat. The simple fact that the metal is coated with zinc does not give any proof that such coat makes the material treated rust proof. It may be that there is too much zinc used, and the coat is unnecessarily thick, or not thick enough to make it rust proof. These difficulties are overcome entirely by the electro galvanizing process, as the coat can be regulated and any thickness required to give absolute protection can be applied, as explained and demonstrated later on.

By the hot process as well as by the electro process, the material is covered with zinc for protection against corrosion. This is accomplished by both processes, and we would like to ask what difference it makes how the zinc is applied; if by dipping in molten metal, by electro process, or any other way. It is not the way that the zinc is applied which makes the metal rust proof, but the real coat of zinc covering the material on the surface does it.

As mentioned above, by the hot process only one thickness of coat can be effected; it may be just enough, it may be too much and zinc may be wasted, rendering the cost higher than necessary, or it may not be enough and does not give sufficient protection. By the electro process the thickness of coat can be and is regulated perfectly, according to requirements. Articles for ordinary exposure without any wearing can be coated very lightly, accomplishing a saving of 75 to 90 per cent. of spelter (taking into consideration the dross accumulated), against the hot process; for material having to stand a certain wear, the coat should be that much heavier; for other material which is affected by acids, sea, salt water, or acid fumes, &c., a still heavier coat should be applied. The zinc coat applied by the hot process is always of one thickness, or rather cannot be regulated at will, while the quality of the zinc being sometimes more and sometimes less impure makes the protecting effect uncertain. As explained above, by the electro process again the thickness of coat can always be made absolutely exact to answer any requirements; the metal deposited is chemically pure zinc, so that a certain thickness of coating once found satisfactory will always give positive protection.

Referring to the tests given in Mr. White's article, we beg to state that they do absolutely cover our practical tests, and we appreciate this very much, as both tests made independently cover each other, and no information whatever has even been furnished for the tests. Another practical proof may be found by the use of the electro process by the Government for the navy yards. About four years ago the Brooklyn Navy Yard installed the first plant for galvanizing battle ship material, and after three years' use and testing the results were found so satisfactory that similar plants were installed for the Norfolk, Boston and Philadelphia yards.

Besides hundreds of other instances, one important proof may be found in the use of the electro process for the material used for strengthening the Brooklyn Bridge some years ago. The proper authorities made, before deciding to use the cold galvanizing process for this material, very severe tests which resulted finally in adopting the cold galvanized material.

The large saving in spelter in connection with newly patented devices, which make it possible to reduce the cost for handling the material to be galvanized to a nominal amount, makes the electro galvanizing process a very dangerous competitor to the hot galvanizing.

U. S. ELECTRO GALVANIZING COMPANY.

BROOKLYN, N. Y., February 5, 1906.

Zug & Co., Limited.—The 20-year limited partnership of Zug & Co., Limited, owning the Sable Iron Works, Pittsburgh, expired February 1, and at a meeting then held three trustees were chosen to take charge of affairs in furtherance of a plan of liquidation to determine the

interests of various persons in the property. These trustees are Charles H. Zug, Charles H. Reid and H. G. Dravo, their selection being subject to the approval of the courts. The firm manufactures muck bar, refined iron bars and black and galvanized sheets and will continue its business, but liquidation and reorganization are necessary on account of the expiration of the limited partnership. This is one of the oldest iron establishments in Pittsburgh, the original plant having been built in 1845. The firm is very much cramped for room in its present location and it is possible that it may be decided to remove the works to another location to provide room for additions that are contemplated, these including the erection of an open hearth steel plant to supply sheet and tin bars.

The Steel Wool Test Case.

After several weeks of careful preparation on the part of importers and the Treasury Department the Board of United States General Appraisers will formally take up the steel wool test case February 15. As previously stated in these columns, the Buehne Steel Wool Company will again lead the importing interests in the fight against the 45 per cent. duty which the Government desires to levy on the wool. Since the Treasury Department decided to drop the litigation instituted two years ago and begin anew the question of assessment before the Board of Appraisers the legal representatives of the Government have been busily engaged in gathering data which will strengthen the Treasury's contention. It is understood that several domestic manufacturers and handlers of steel products have volunteered to assist the Treasury in convincing the Board and the courts that the higher duty should be affirmed on the wool.

On the other hand, the importers have not been idle. Last year the lower customs tribunal promulgated a decision upholding the claims of the Buehne Company, and the importers see no reason why the Board should now reverse itself. The importers will maintain that the merchandise is dutiable according to its value per pound under the provision in the tariff for "steel in all forms and shapes not specially provided for." So much evidence has been accumulated by both sides that it is likely that the Board will be under the necessity of holding several hearings.

Blast Furnaces Under Construction.—According to information gathered by the American Iron and Steel Association 17 blast furnaces were in course of erection at the close of 1905, and three furnaces were being rebuilt. Of the furnaces building two were located in New York, four were in Pennsylvania, one was in Tennessee, two were in Alabama, three were in Ohio, two were in Illinois, one was in Michigan, one was in Wisconsin and one was in Colorado. With the exception of the Michigan furnace all of these furnaces when completed will use coke or mixed anthracite coal and coke for fuel. The Michigan furnace will use charcoal. Of the three rebuilding furnaces one was in Pennsylvania, one was in Kentucky and one was in Ohio. When rebuilt all three furnaces will use mineral fuel.

Sydney Rod Mill Records.—Following are the December and January figures of production of the rod mill of the Dominion Iron & Steel Company, Sydney, Nova Scotia:

December, 1905.		Tons.	Lbs.
Maximum, 24 hours.....	295	1,250	
Minimum, 24 hours.....	217	1,320	
Average, 24 hours.....	270	1,230	
Days, 25 turns.....	3,176	120	
Nights, 25 turns.....	3,587	1,510	
Total, 50 turns.....	6,763	1,630	
January, 1906.		Tons.	Lbs.
Maximum, 24 hours.....	339	1,560	
Minimum, 24 hours.....	259	1,090	
Average, 24 hours.....	293	260	
Days, 25½ turns.....	3,445	1,980	
Nights, 25 turns.....	3,954	440	
Total, 50½ turns.....	7,400	180	

Frederick T. Towne.

Frederick Tallmadge Towne, general superintendent of the Yale & Towne Mfg. Company and younger son of Henry R. Towne, the company's president, died at his home in Stamford, Conn., Sunday morning, February 4, of Bright's disease. Mr. Towne had just finished an address on Saturday afternoon to nearly 1000 employees of the company—it being the occasion of a semi-annual distribution of \$1200 offered yearly by the management for suggestions designed to be of mutual benefit—when he collapsed, barely regaining consciousness but once before he passed away, a few hours later.

Mr. Towne was born in Stamford March 5, 1872, and after preparatory courses in Stamford schools entered the Massachusetts Institute of Technology. After leaving college he entered the works in Stamford and regularly worked his way up through the various departments, studying the business and methods of management, with the sole purpose of qualifying himself intelligently to make a specialty of a business then highly specialized. The course in mechanical engineering he had chosen with special reference to this particular work. The business of manufacturing logically divides itself into two grand di-



FREDERICK T. TOWNE.

visions, mechanical and commercial, or distribution of the product. Mr. Towne chose the technical part through taste and inclination, specializing to fit himself for it. At the time he had fairly qualified himself for serious work in the Yale & Towne works his father, Henry R. Towne, was still living in Stamford, and he became his father's assistant. Later, as he developed, and especially as his father took up the work of marketing the product, at the executive offices of the company, in New York, he became, first, assistant general superintendent and finally general superintendent, holding the latter position for the past six or seven years. He filled the position admirably, with the sure grasp of administrative technical details and with exceptional ability to direct and command the best efforts of other men. So far as known by those who knew him most intimately, he had no enemies; notwithstanding, he was a strong man in a position of power to direct other men. He possessed good judgment, skill, perfect self control and, above all, a sense of justice that was recognized and trusted by all who were under him. He had a high sense of his responsibility, not only in an official but personal appreciation of his duty to other men, which was unquestionably a factor in making him so active in numerous outside matters.

Mr. Towne was one of the earliest officers and a member of the Administrative Council of the National Foundrymen's Association, first its vice-president and then president in 1902-3, always manifesting a deep interest and taking an active part in the affairs of that useful organization. He was keenly interested in all local affairs in Stamford and recently served as a member of the Board of Appropriation, the chief local governing body.

He was a vestryman in St. John's Church. With some others he was a promoter and worker in night schools for boys, and had been leader and chief organizer of all welfare work in the Yale & Towne plant, in the sense of cultivating a warm interest in the health, comfort and pleasure of the large body of employees, including the organization of night classes, in which there are about 50 students, who met in a room provided by the company and under the charge of competent instructors. There are also other courses of instruction for young men entering the service of the company and desiring to qualify either for mechanical or commercial positions in the business, these courses taking four years to complete. It was while addressing the assembled workmen, as previously mentioned, that he was stricken, literally dying in harness. Almost his last words were intended to convey to employees that it was the company's desire, as it was his personally, for closer sympathy and mutual interest between employers and employees and the good will of all personally under him. It was a grand and fitting close to a useful and noble life.

Mr. Towne was inherently an organizer, delighting in studying problems related to organization of labor and work, and was most effective in solutions of questions of that character, possessing great skill in the selection of men for difficult positions, not merely training them but helping them to understand their work and accomplish it successfully. He was always sympathetic with them, ready to listen and counsel, but not to carry their burdens for them, he expecting them to do their duty as he tried to do his. In his home and social life, while possessed of a certain quiet reserve, with those whom he knew well he was cordial, sympathetic, a good companion and true friend. In the community where he was born, lived and died nearly every one in active life knew him personally and held him in high esteem. He was a member of the Suburban Club and Wee Burn Golf Club of Stamford, the Engineers' Club of New York and St. Anthony Club of Boston. He is survived by a widow and two sons.

Metallurgical Problems in the Foundry.*

BY RICHARD MOLDENKE.

To-day, with all the advance made in the foundry art, we have by no means completed the work. We can now all specify the metal we want for our particular purpose. We can handle the cupola and air furnace so that we know what we do. We can calculate our mixtures to a nicety of composition and minimum cost. But we have still to know why some irons make better rolls than others of like composition and how far we may trust ourselves to hold the gray iron foundry against the invasion of the steel casting and yet give the buyer the best for his purpose that he can obtain.

It is a very noticeable fact that foundrymen all over the world are recognizing the necessity of accurate information on all the lines of their work. The responsible head of a foundry no longer can be told by his subordinates that unless such and such irons are had no castings can be made. Those autocrats of former days are asked to step aside, and the result usually is a greater output per man and cheaper castings in that shop. Even the associations organized for labor purposes only are finding it desirable to enliven their meetings by an occasional paper on foundry practice, and the result is certainly a benefit. The foundrymen of the Pacific Coast are also alive to this work, and we shall soon hear more from them. England and Germany are vying with us to promote the welfare of the industry from the technical standpoint, and we can everywhere recognize the earmarks of important foundry problems, which it is up to us to solve.

* From an address before the Pittsburgh Foundrymen's Association, February 5, 1906.

Adding Steel to Cupola Mixtures.

These problems are perhaps best separated into two general classes: First, the production of castings at the lowest possible shop cost, and second, the development of the highest grade of materials in these castings. Taking the general needs of the foundry first, we see that as we reduce the impurities of that complex substance, cast iron, we get nearer a uniformly good material. The addition of steel to cast iron does this very thing and is therefore to be encouraged and studied much more than has been the case so far. The real benefit is in the reduction of the total carbon, with the consequent reduction of the graphite, everything else in the composition being so arranged that the combined carbon remains small. The consequence is a purer cast iron but yet a cast iron. Now the technical difficulties in using steel in the cupola are such that with large amounts correctives must be applied. The study of this problem must be held the most important to-day, as bearing directly on the gray iron foundry holding its own. As the price of steel will undoubtedly go up, methods of refining iron in the air furnace will be studied closer, and far seeing foundrymen are giving this subject their earnest attention. Perhaps the ultimate result will be the use of the open hearth furnace, where the output will warrant it.

The Removal of Sulphur.

This subject brings us to further ideas in connection with the reduction of the impurities in cast iron. We are looking for an efficient method of removing sulphur from iron, either by removal from the coke used in melting or from the pig metal in its making, or more likely from metal and coke in the foundry melting. There is no reason why this object may not be attained. Only the demand for higher grade castings will stimulate research, and the sooner it is started systematically the better.

Whether it will ever be important enough for us to worry about the removal of phosphorus from cast iron I cannot say, for so long as Bessemer ores exist we can select our irons in this respect from a great variety of brands. Manganese is apt to get higher in our pig irons, and it is a question whether some day a washing process will not have to be resorted to at the blast furnace, with the addition of high silicon to get the metal right again for the foundry. Bear in mind that our aim, no matter what we can or cannot do with high or low manganese, must be directed to a cast iron with the minimum of impurities consistent with the proper regulation of the combined carbon content.

With sulphur, carbon, manganese and phosphorus attended to, we have remaining only silicon and the oxidation effects, dissolved gases and the like, which may make or mar an iron, usually unknown to us. Briefly, the silicon will always be the basis of our calculations, as even with a minimum of total carbon, due to the addition of as much steel as we can handle, the machine shop will demand properties in the castings which compel us to keep the combined carbon below fixed limits. The less the graphite on top of this the better for strength.

The Question of Oxidation.

The oxidation of metals during the melting process is now becoming a well recognized matter. We are still, however, looking to our laboratories to give us something tangible to work with. Here is the most important problem for the foundry chemist. What untold losses this trouble in the foundry is the basis of, and how convenient a scapegoat it becomes for troubles it has no connection with can hardly be realized. Even in the making of steel castings, aside from the loss of the elements by burning out to get the proper composition for the ingots, there is a wasting of the metal, or oxidation, which vexes many a foundryman. A further problem is then before us—how to melt iron, or steel for that matter, without burning away from 4 to 14 per cent. Perhaps the electric furnace will solve this for us. It has certainly done it already from the technical standpoint and awaits only the commercial efficiency to become a permanent factor in our foundries. The probability is that the small steel casting will see the beginning of this interesting development in foundry practice.

Ferro Alloys.

Every year sees new ideas worked out, the object of which is the enlargement of our means to obtain a variety of results with the least hindrance to the shop. Thus the recent use of very high iron-silicon alloys by Mr. Outerbridge, with which he takes an average low silicon mixture and adds the alloy in the ladle, bringing it up at once to a soft metal, is an example of getting the greatest variety of metal with the least trouble. With close watching that the mixture is uniform, and with the silicon in the alloy very high, no appreciable cooling of the ladle will result, and there is accomplished what could not be done satisfactorily with the use of low silicon scrap and softeners in the cupola charge. Thus another problem has been solved in its way, and a direction pointed out in which possibly the oxidation trouble can be solved—namely, by high class deoxidizers in the form of ferro alloys easily susceptible of oxidation at the comparatively low temperature of melted cast iron.

If a given casting weighs half as much when of steel as of gray iron; if in the making of that steel less material is lost, less labor used, and there are other economies more than balancing the extra weight of the gray iron; then the country should be given the benefit of the steel and the gray iron be discarded. If, on the other hand, we can so improve our product that the extra cost of making in steel exceeds that of the additional small amounts of cast iron we put in, then will the gray iron foundry be in the line of true economy and will hold its own in spite of any attacks that may be made. We cannot resist the inevitable, but if we set ourselves right, and that by knowing thoroughly what we are doing, we can rest easy. Costs may go up or go down. They do so on all classes of material, whether gray iron or steel. But quality should always go up and never down.

Iron and Steel in Canada.

Steel Rails for the West.

TORONTO, February 3, 1906.—Fort William's steel rail traffic continues heavy. To the thousands of tons delivered there before the close of navigation, most of which is still stored there, additions are being made by shipments from the mill at Sault Ste. Marie. These, of course, came by the all rail route. Of the lake receipts in the latter part of 1905 some came from the Carnegie Works. Various are the destinations of the rails received at the port. Some are for lines in British Columbia, but most are for the prairie country. A considerable tonnage is for extensions of the Great Northern's lines in the Pacific Province. A smaller quantity is for relaying a section of the Canadian Pacific's Crow's Nest Pass road in the same province, 80-pound rails being put down for lighter ones. It is estimated that upward of 5000 carloads are for British Columbia. Ten to 15 carloads per day are being shipped into the interior. Deliveries on account of the Lake Superior branch of the Grand Trunk Pacific must begin very soon, as the road is to be pushed rapidly to completion from Fort William to the point of junction, 205 miles to the northwest on the main line.

New Railroad Construction.

Tenders are now called for by the Transcontinental Railway Commission for the building of two sections of the eastern division of the National Transcontinental Railway. One section is that from Winnipeg eastward to the point of juncture with the Lake Superior branch of the Grand Trunk Pacific and is 245 miles long. The other is from Quebec city northwestward to La Tuque, on the St. Maurice River, and it is 150 miles long. Besides these two stretches of railroad line the steel superstructure for a viaduct 3000 feet long, to cross Cap Rouge Valley, is likewise thrown open to tender. The three tenders must be put in separately and must be in the hands of the commissioners by March 12. One condition of the contracts will be that the current rate of wages must be paid. Another will be that the materials used must, as far as possible, be purchased in Canada. That the work must be done with dispatch is to be inferred from the expressed desire of the Government that the

section from Winnipeg to the junction with the Lake Superior branch be completed in time to be used in the transportation of the next wheat crop. Of course it could have no value for that purpose if the Lake Superior branch were not also completed by next harvest. So in the next seven or eight months it is proposed to build 450 miles to connect Winnipeg with Fort William. In the same period the Grand Trunk Pacific expects to build an equal mileage of its western division, as it has given out contracts for as long a stretch from Portage la Prairie westward. To these sections of the new Transcontinental line add the 150-mile stretch to be put under contract from Quebec to La Tuque and it will be seen that upward of a thousand miles of the system are expected to be built before next winter.

But the government's section and the company's section, as now provided for, do not make up the whole of what is to be the National Transcontinental Railway system. The act incorporating the company specifies the capital, limiting it to \$25,000,000 common stock, plus \$20,000,000 preferred stock. For purposes of expansion, it is true, a joint stock company is usually able to get its authorized capital increased. But the company's agreement with the government requires a third party, the Grand Trunk Railway Company, to hold the common stock and thus control the Grand Trunk Pacific Railway Company. As this provision of the agreement has the effect of making a fixity of the latter company's capital, some other means has to be devised for expansion. This has been provided for by the organization of still another company, whose part in the making of the National Transcontinental Railway will be the building and operating of branch lines. The new company will only be a different name for the same corporate proprietor as controls the main lines of the system. It will apply for a charter in the next session of Parliament. On its part the parent company, the Grand Trunk Pacific, is applying for power to guarantee the bonds of any company incorporated for the building of branch lines, or for the acquisition of rolling stock, or for any purposes allied with or subsidiary to those of the Grand Trunk Pacific. In return for the bond guarantee the branch line building company will doubtless lease to the Grand Trunk Pacific the 23 branches it proposes to build, the rental being some nominal amount in excess of the annual debt charges. These 23 feeders to the Grand Trunk Pacific will be built from the north and from the south, and will include a line to Hudson Bay and a branch traversing the length of Vancouver Island.

Steel Shipbuilding.

At Halifax, on the 29th ult., the Tariff Commission heard a petition and arguments in favor of a bonus of \$6 a ton in aid of the steel shipbuilding industry. Alderman Johnston of the City Council was the spokesman. He reminded the commissioners, all of whom are members of the Cabinet, of the visit of the joint committee to Ottawa on the same business last year. He adduced the fact that Halifax, Dalhousie and the Provincial Government of Nova Scotia all stand committed by by-law and by statute to severally aid steel shipbuilding works established in either of the cities named to the amount of \$100,000, that is, \$300,000 in all.

Canners appeared before the commission to ask that no duty be imposed on tin plates.

Mr. Macdonald, editor of the *Halifax Chronicle*, made a plea for a bounty to the domestic ore producer as distinct from the pig iron maker.

In Londonderry Thomas J. Drummond, president of the Londonderry Iron Company, urged the commission to increase the duty on pig iron and that a bounty of \$2 a ton be paid for a further period of five years.

J. P. Edwards, manager of the Montreal Pipe Works, asked for an increase of the duty on iron pipe equal to the present preference in Britain's favor, in order to protect the domestic trade against Scottish makers.

C. A. C. J.

The House Committee on Rivers and Harbors at Washington has recommended the adoption of a joint resolution calling upon the members representing the

United States on the International Commission to report to Congress what action is necessary to prevent the further depletion of the water flowing over Niagara Falls, and also directing them to exert all possible effort in conjunction with commissioners representing the Dominion of Canada for the preservation of the Falls in their natural condition. The committee says in its report to the House that it has been alleged that the utilization of the water of Niagara River under privileges already granted may cause the cataract on the American side to disappear entirely.

Refractories and Fire Brick.

William A. Stanton, New York, representing the Harbison-Walker Refractories Company, Pittsburgh, read a paper on "Refractories and Fire Brick" at a meeting of the Niagara Frontier Purchasing Agents' Association, held at the Lafayette Hotel, Buffalo, January 18, from which the following extracts are taken:

In the manufacture of the highest grades of fire clay brick about 14 processes or handlings are necessary before the bricks are on cars ready for shipment. In the manufacture of 1000 bricks about 4 tons of raw clay and approximately 1 ton of coal are required in the various processes of drying and burning. The best fire clay bricks are hand made, and there is always a considerable amount of breakage on the floors and kilns, so that we might say, approximately, 5 tons of material are used in the manufacture and about one-half a ton is culled out before 1000 properly selected uniform clay bricks can be shipped.

The limit of refractoriness for the highest grade of fire clay brick could be put at about 3350 degrees F. There are only one or two brands that could stand this, and a temperature as high as this would be too much for regular work; probably 3000 to 3100 degrees is the highest working temperature the best fire clay brick would stand.

In studying the conditions under which fire clay bricks are used, it has been found absolutely necessary to vary the grind, mix and burn in order to meet these conditions and insure the bricks shipped for a certain purpose are uniform. Uniformity, next to quality, is the most essential requirement in fire clay brick. Variations of mix, grind and burn enable the manufacturer to select brick for blast furnaces that in the hearth and bosh of the furnaces will be able to withstand the high temperatures as well as the action of the molten slag, iron, &c. In the inwall the temperatures are not so high as around the tuyeres, but the pasty condition of the stock and its ability to stick and tear out the brick, as well as the chemical action of reduction, require that the lining at this point shall be adapted to meet these conditions; while in the upper portion of the furnace the large volume of reducing gases under pressure, the abrasion of the stock falling from the bell and the bombardment with gases loaded with fine particles of coke, ore, &c., which constitute a sand blasting action, all demand that the utmost care and experience be given to the lining at this part of the furnace if it is expected to stand any reasonable length of time.

When we come to brick for hot blast stoves we have severe conditions prevailing in the combustion chamber which demand a brick of the highest refractoriness; this is also the case in the dome and the upper portion of the stove. In the checker work the passage of gases of high temperatures, loaded with fine dust, demands that the bricks should be refractory, strong, should not scale or dust and be of good workmanship in order that they may fit closely, and thus avoid, as much as possible, the tremendous movement in the stove due to the variation of temperature caused by turning in cold air on hot brick work. The girder tile and checker work in the lower portion of the stove have to withstand movement and weight amounting to several hundred tons of superimposed brick work. All this demands the best care and attention of the manufacturer to insure long life. Two or three years ago in Pittsburgh one of the large iron manufacturing companies had the experience of practically the whole of its stove brick falling to pieces. The

bond of the brick was destroyed by the action of the gases and grinding action of the stove, and the material was shoveled out in the form of small pieces and dust. This was after a run of only eight or ten months. The bricks for piping, down comers, valve openings, &c., all have to be made to withstand the variation of temperature and the spawling action due to the frequent openings and rush of cold air on the hot brick work.

Brick for mill furnaces has to meet very different conditions from those prevailing in blast furnaces. The intense heats of heating furnaces and soaking pits demand a brick not only of the highest quality as to its capacity to resist heat, but a brick that shall not spawl or flake when subjected to variations of temperature, and the manufacturer is obliged to vary his methods of manufacture in order to meet these conditions. Other purposes for which fire clay brick is used, such as malleable furnaces, air furnaces, boiler settings, stokers, copper furnaces, crucible furnaces, cupolas, metal mixers, cement kilns, &c., all have conditions peculiar to themselves, and all demand most careful consideration before the brick can be manufactured to give the most economical results.

The laying of brick is a very important matter, as is also the clay used in the laying. This clay should always be of the same composition as the brick laid with it. The smallest possible amount of clay should be used in the joints. Thick joints and poor clay have caused more wasted brick and more expense than almost anything else that could be mentioned.

The vital importance of slow and thorough drying out in all construction work, such as blast furnaces and stoves, is seldom appreciated. Steam is fatal to the bond of brick, and when we remember that some of the walls of blast furnaces contain as much as 5 or 6 feet of lining, almost, in a straight cylinder 80 to 100 feet high, it is impossible to believe that the moisture can be driven out of the walls in any such short period of time as some blast furnace managers now give to the blowing in of furnaces. There is no question that some of the recent failures of linings have been due to rapid blowing in, and while the natural anxiety of blast furnace managers to make iron in these times is understood, it does not appear reasonable to blame the brick when it is known that the furnaceman took only about one-sixth of the time necessary to dry out such a mass of brick work.

OBITUARY.

EZRA SAWYER, inventor and manufacturer, died at Worcester, Mass., January 31, aged 90 years. He was born at Boylston, Mass., July 27, 1815, and in his early manhood learned the trade of loom fixer. Afterward he was employed in Worcester for many years as a pattern maker, among other employers being the Union Water Meter Company, in which he afterward became a director. With Benaiah Fitts he invented a metal separating machine which he manufactured until his death and which became widely known. He was prominent in the Congregational Church, the Worcester City Missionary Society and the Worcester County Mechanics' Association. He leaves a widow.

ENOCH FILER, one of the pioneer coal operators of the Shenango Valley, recently died at Sharon, Pa., at the age of 80 years.

Antiquated building laws are responsible for delay in the introduction of the steel frame building into London. It is required that the thickness of external and party walls shall follow certain schedules based upon the heights of the buildings to be erected. For a building 120 feet high the first story must have a thickness of 34½ inches; second and third, 30½ inches; and so on, until the top floor has a wall 13 inches thick. This results in taking up a large amount of valuable space and completely nullifies one of the main reasons for the modern type of construction. The use of these extremely thick walls is very expensive and has little to commend it.

PERSONAL.

O. G. Ferguson has been appointed superintendent of transportation of the Monongahela Connecting Railroad, Pittsburgh, owned by the Jones & Laughlin Steel Company.

W. H. Hugus, for 28 years superintendent of the Davidson plant of the H. C. Frick Coke Company, in the Connellsville region, has resigned and R. C. Beerbour has been appointed to succeed him.

Lewis H. Taylor, honorary president of the Taylor Iron & Steel Company, High Bridge, N. J., celebrated the ninety-fifth anniversary of his birth January 29.

H. S. Bradley has been appointed commercial agent of the Wabash Railroad system at Pittsburgh.

W. P. Snyder, president of the Shenango Furnace Company, has gone to Florida and will be absent until April 1.

T. F. Salter, for three years chief mechanical draftsman for the C. W. Hunt Company, New York, has severed that connection to accept the position of chief engineer of the North Penn Iron Works, Philadelphia, Pa. Mr. Salter, who is quite a well-known yachtsman, was presented with a fine pair of Hensoldt binoculars as a token of the esteem in which he was held by his associates.

Alexis W. Thompson, former president of the Republic Iron & Steel Company, has moved to Birmingham, Ala.

Samuel McDonald, formerly superintendent of the Bessemer plant of the Republic Iron & Steel Company, Youngstown, Ohio, but more recently connected in a similar capacity with the Tennessee Coal, Iron & Railroad Company, has resigned his connection with the latter concern and has bought a fruit farm in California, to which he will remove in a short time.

W. H. Marshall, Cleveland, Ohio, general manager of the Lake Shore & Michigan Southern Railroad, was elected president of the American Locomotive Company at the meeting of the Board of Directors held February 5. He is 42 years old and his advancement has been through the motive power department of the Chicago & Northwestern and the Lake Shore railroads, in which he has displayed both mechanical and administrative ability.

The Railway Appliances Company, Chicago, announces the connection of Sheldon E. Bent with that company in its track department. He has been located in Mexico for several years as superintendent of transportation of the Oceanic Railroad of Mexico and as general superintendent of the Vera Cruz & Pacific. Previous to that he was at one time superintendent and then purchasing agent of what is now a part of the Brooklyn Rapid Transit Company.

Cecil M. Sanders of the well-known firm of Lewis Lazarus & Sons, London, is now in this country.

Important changes will be made this month among officials of the Pittsburgh Coal Company, at Pittsburgh, and its identified interest, the Monongahela River Consolidated Coal & Coke Company. A. M. Robbins will retire as president, and M. H. Taylor, of Erie, Pa., will be elected to fill the vacancy. It is said that Mr. Robbins will continue as chairman.

W. B. Leeds has resigned as a director of the American Can Company and has been succeeded by R. H. Ismon.

What is said to be the highest dam in the world has been built on the Salt River, Arizona, and will submerge and completely obliterate the town of Roosevelt. The work is well under way and it is expected that by 1908 the town will be 172 feet below the surface of the water. It is expected that the head obtained will be the means of securing abundant power. A temporary power plant, a cement mill, ice plant, lighting plant and saw mill have been completed. A telephone line has been installed to the headworks of the power canal, 18 miles above Roosevelt, and extended in the other direction to the site of the great dam, which is 30 miles from Phoenix. The electric power plant at present in service is operated by steam.

NEWS OF THE WORKS.

Iron and Steel.

For some time the Republic Iron & Steel Company has been making preparations to install the direct metal process at its Bessemer steel plant at Youngstown, Ohio. It is expected that within about two months the equipment will be in place and the process in use.

The Atlantic works at New Castle, Pa., owned by the Republic Iron & Steel Company, but which has been idle for a long time, is being dismantled. The plant consists of a cut nail factory, puddling mill, two-high muck mill, two skelp mills and a guide mill.

The furnaces of the Tennessee Coal, Iron & Railroad Company are now turning out large quantities of iron in the Bessemer, Ala., district. It is understood that the Little Bell Furnace will be in operation again very soon.

The Carnegie Steel Company is preparing to erect two new blast furnaces and an open hearth steel plant at New Castle, Pa., on land just east of its present works.

The Princess Iron Company, Glen Wilton, Va., blew in its Princess Furnace on January 8.

The Rockdale Furnace, Rockdale, Tenn., was blown in January 27.

The West End Furnace of the West End Furnace Company, Roanoke, Va., was banked for repairs on January 13, and had not resumed on February 1.

The January output of the No. 2 Sheridan Furnace, at Sheridan, Pa., was the largest this furnace has ever made—4030 tons, all high grade foundry iron. The No. 1 Sheridan Furnace has been dismantled.

Detroit Furnace of the Detroit Iron & Steel Company, on Zug Island, River Rouge, was blown in on January 11 after relining.

The open hearth department of the Elmira Steel Works, Elmira, N. Y., has been started up recently, being operated by the Lucknow Iron & Steel Company, Harrisburg, Pa. There are two basic open hearth furnaces of 20 tons capacity each.

The Morgan Construction Company, Worcester, Mass., has just secured an order from the International Harvester Company, Chicago, for its South Deering Works, for a continuous merchant mill for producing rounds, flats and medium sized angles. This includes continuous roughing and finishing trains, heating furnace, gas producers, conveyors, two cooling beds and all auxiliary machinery. The order is supplementary to one for a lighter mill placed with the Morgan company in 1902.

Fast progress has been made in rebuilding the Greenville Works of the Carnegie Steel Company, at Greenville, Pa., which was very seriously damaged by fire last month. The 8-inch mill has already been started and the 10-inch mill is expected to start this week. The fire occurred January 11 and the time made in rebuilding the plant is considered remarkable, the work being started on January 19 and rushed day and night, much heavy machinery and material being sent by express.

The Southern Steel Company's nail mill at Ensley, Ala., will be rebuilt as soon as the insurance is adjusted. The plant was fully insured.

The Norton Iron Works, Incorporated, Ashland, Ky., is overhauling and repairing its blast furnace and it will probably blow in about March 15.

General Machinery.

The Department of Public Works, Chicago, will receive bids until February 17 for furnishing a 1100-pound single frame steam hammer.

The La Salle Machine & Tool Company, La Salle, Ill., has incorporated with a capital stock of \$20,000. The object is the designing and manufacture of special machinery and tools of all kinds. A building is now in process of erection which it is expected will be completed in time to begin manufacturing operations in April. Officers of the company are: President, E. Roth; vice-president, Geo. P. Blowl; secretary and treasurer, F. G. Trenary; general manager, F. W. Matthiessen, Jr. The directors are the officers, together with F. W. Matthiessen, Sr.

The Case Mfg. Company, Columbus, Ohio, is busily engaged with a full shop force on heavy orders received from the New York and Brooklyn Edison companies, also the Pennsylvania Railroad. The rush of other orders has been so great as to compel the company to greatly enlarge its capacity, which has been done by the erection of an entirely new shop in addition to the former plant.

Curtiss, Randall & Co., Champaign, Ill., have organized to carry on a general machine shop and foundry business. The property formerly operated by the Champaign Machine & Supply Company has been purchased and operations began February 1. The members of the new company are A. R. Curtiss and B. T. Randall.

The Rensselaer Mfg. Company, Troy, N. Y., manufacturer of valves, hydrants, water gates, &c., is extending its machine shop department.

The Jennings & Griffin Mfg. Company, Yalesville, Conn., manufacturer of mechanics' tools, is to erect a one-story iron frame building, 46 x 88 feet, to be devoted to a forge shop.

D. B. Hoffer & Sons, Lebanon, Pa., have leased a building in Reading where they will open with a large line of Springfield gasoline engines and second-hand machinery, engines, boilers, &c. An up to date repair shop will be maintained in the new quarters, to which the main office has been transferred. The firm will, however, continue branches at Lebanon and Allentown.

The Robins Conveying Belt Company, New York, has recently secured an order from the Imperial Japanese Navy for a 12-inch belt conveyor for the arsenal at Tokio. Among other orders the Robins company now has on hand is one from the Solvay Process Company, Syracuse, for conveyors for its stone crushing plants, and one from its agents in South Africa for a conveyor for use in talling stacker in one of the large gold mines in the Rand.

William Ward, House Building, Pittsburgh, dealer in second-hand machinery, is building an addition to his warehouse, 75 x 100 feet. The warehouse is located on the Wabash railroad, near Pittsburgh.

The J. P. Devine Company has been incorporated at Buffalo with a capital of \$100,000 to manufacture vacuum driers under the patents of Emil Passburg of Germany for which it controls the manufacturing and selling rights for the United States; also to manufacture special machinery, engine and boilers. The directors are Joseph P. Devine, William Strohn, William P. Kamps, Sydney A. Benedict and Herbert P. Bissell.

The Florence & Cripple Creek Railroad has let contract for rebuilding its shops at Canon City, Col., which were destroyed by fire some time ago.

J. W. Paxson & Co., Philadelphia, Pa., are to erect a two-story machine shop at 1048-1054 Beech street.

Owing to a fire in the neighborhood and the alarm being sent from the plant of the Union Drop Forge Company, Chicago, Ill., it was erroneously stated last week that the company's plant was burned. The company suffered no loss whatever from the fire. It has about completed the construction of its new forge building and has purchased the necessary hammers and presses from the E. W. Bliss Company, Brooklyn, Niles-Bement-Pond Company, New York, and the Chambersburg Engineering Company, Chambersburg, Pa. This new equipment will about double the company's facilities.

Power Plant Equipment.

The Westinghouse Electric & Mfg. Company has recently closed a contract with the Southern Power Company, at Charlotte, N. C., for a large and complete power equipment consisting of eight 3000-kw. water wheel type alternators, with a complement of transformers, exciters and switchboards. This is the largest contract for electrical apparatus placed in the South for some years. The Southern Power Company's plant being situated in the midst of the cotton mill district, will open up opportunities for the use of electric drive by the surrounding cotton mills and other industrial plants, which have heretofore been impossible because of the lack of cheap electric power in that vicinity. The Westinghouse Company has also received an order from Baltimore, Md., for 100 No. 101-B four-motor equipments complete with all details, and a contract for the electrical equipment of the Pittsburgh & Butler trolley railway system, now being built by the Pittsburgh Railways Company, and which is expected to be in operation June 1. The electrical system will be similar to that now being installed on the New York, New Haven & Hartford Railroad. The trolley construction will be of high speed type and the cars will be able to operate at 45 miles an hour.

The inventors of the Veitch-Matthews turbine engine are delighted with the success of their newly patented engine, which is now completed and is running the machinery or plant known as the Veitch-Matthews Foundry & Machine Company, located on Twenty-sixth street, between Seventh and Eighth avenues, Bessemer, Ala. This engine is attracting a great deal of attention because of its exceedingly small size, light weight and power. A 15 horse-power engine of this patent weighs less than 600 pounds, is set on a foundation consisting of two pieces of plank four or five feet long, running itself 800 or 1000 revolutions per minute. The engine is especially adapted to running machinery requiring high speed, such as electrical motors, elevators, saw-mills, cotton gins, threshing machines, &c.

The Foster Motor Company, New Haven, Conn., manufacturer of gas and gasoline engines, has been incorporated in Connecticut as the Foster Motor Company, Incorporated, with Charles W. Foster as president and general manager; John W. Hine, secretary and treasurer. The company will retain its location, 31 Crown street, for the present, but with larger manufacturing space.

The Forter-Miller Engineering Company, engineer and contractor, Westinghouse Building, Pittsburgh, has recently secured an order from the Owens European Bottle Machine Company for a Forter gas producer installation of 100 tons daily coal capacity, to be built at Manchester, England.

Very little equipment will be needed by the Hart Grain Weigher Company, Peoria, Ill., for the new addition to its foundry, 50 x 132 feet, as its cupola capacity is ample. The company is adding three sly tumbling mills, emery grinders, additional trolley systems, ladles, etc., all of which have been purchased. The new additions will be devoted entirely to custom work.

The American Foundry Company, South Framingham, Mass., which has been conducting an iron foundry for the past nine

months, has been incorporated in Massachusetts with a capital stock of \$10,000. The officers are: President, T. J. Cahill; treasurer, T. E. Raymond; clerk, R. M. Raymond.

William Highton & Sons, Nashua, N. H., manufacturers of registers, are putting in a new cupola which will afford a much needed increase in the product of their foundry.

A representative of the SeEVERS Mfg. Company, Oskaloosa, Iowa, has been in Houston, Texas, for the purpose of looking over the field with a view of establishing a boiler plant there. The company makes steam and hot water boilers and intends to locate another plant, the site for which has not yet been determined. No specifications for the equipment or plans for the new buildings have been prepared.

Foundries.

At the annual meeting of the Wheeling Mold & Foundry Company, Wheeling, W. Va., the capital stock was increased from \$200,000 to \$300,000. The following officers were elected: C. E. Blue, president and general manager; L. B. Blue, vice-president, and H. S. Bradley, secretary and treasurer. The directors are Albert Whitaker, C. E. Blue, Charles Copp, B. W. Peterson, W. B. Jones and L. B. Blue.

The Buda Foundry & Mfg. Company, Harvey, Ill., has increased its capital stock from \$300,000 to \$600,000. The company is now building a new warehouse addition and increasing the capacity of its foundry.

The Armstrong Iron Works, Vineland, N. J., has been purchased by John G. Snowden, who will continue the manufacture of iron castings. It is probable that the plant will be enlarged in the near future.

The Mt. Vernon Car Mfg. Company is putting in two new cupolas in its foundry, which will increase the capacity to 450 car wheels per day.

The Parkhurst Mfg. Company, Peru, Ind., has started its new foundry and has installed a No. 60 Newton cupola and a crane made by the Northern Engineering Works, Detroit, Mich.

The Pittsburgh Industrial Iron Works, Westinghouse Building, Pittsburgh, works at Reynoldsville, has recently taken the following contracts: About 300 tons of castings, to be used in connection with high pressure fire mains for New York; three 6-ton cement pulverizing machines for Michigan; two 15-ton structural steel dredge booms for the Panama canal; two large clam-shell derricks for the Pittsburgh filtration plant and also a small quantity of tank and general foundry and machine work. This company makes contractors' and rolling mill machinery, gray iron and brass castings, engines and boilers.

The Buffalo Steam Pump Company, Buffalo, N. Y., is building an addition to its foundry, 80 x 200 feet, with cupola house and core shed attached.

The new foundry of the Buffalo Forge Company, Buffalo, N. Y., will be 200 feet square and will have an electric traveling crane through the center and 33-foot galleries on both sides.

Bridges and Buildings.

The Hell Company, structural iron fitters, has been organized at Milwaukee with a capital stock of \$20,000 with Gustave Wollaeger, jr., J. A. Sheridan and William Ewig, incorporators.

The Ohio Structural Iron Company, Sandusky, Ohio, maker of ornamental and light structural iron work, is making some additions to its plant and has placed orders for new equipment.

Fires.

The plant of the Henderson-Cranford Buggy Company at Valdosta, Ga., was destroyed by fire February 3. The loss is close to \$100,000.

The machinery plant of the Owasso Mfg. Company, Malvern, Ark., was destroyed by fire last week. The loss is placed at \$35,000.

The large vinegar plant of the Fleischmann Mfg. Company at Charles Point, near Peekskill, N. Y., was burned February 3 with a loss of nearly \$200,000.

The machine shop of John R. Cooke, Centreville, Md., was destroyed by fire February 3.

The power house and car barns of the Canton-Aurora Traction Company, Canal Dover, Ohio, were destroyed by fire February 5. The loss is said to be \$100,000.

The blacksmith shop of the Southern Railroad at Spencer, N. C., was destroyed by fire February 5. The loss is placed at about \$30,000.

Hardware.

The Springfield Harrow Company, Springfield, Ill., has incorporated for the manufacture of a special implement called a riding harrow, as well as other machinery. The company will soon be in shape to manufacture about 50 machines daily, and expects to increase its daily output to 150 within a year. Charles E. Wyatt is president.

The Atlas Tack Company, Fairhaven, Mass., states that there is no truth in the published report that it is to go into the manufacture of shoe machinery.

The Schatz Hardware Mfg. Company, Chappaqua, N. Y., which is represented by the Smith & Hemenway Company, 296 Broadway, New York, has materially enlarged its manufacturing facilities by adding another building to its forging department, 40 x 50 feet. A new engine and boiler room, with new engines and boilers, has also been installed. The Schatz com-

pany makes a feature of hardware specialties and special tools. The line also includes a series of moderately priced nail pullers, miter boxes and electrical tools.

Landers, Frary & Clark, New Britain, Conn., manufacturers of cutlery and hardware, will build this spring a one-story brick tinning room, running along the Elm street side of their property south of the new foundry building which is in process of erection. The building will be 74 x 158 feet and 18 feet high.

Owing to the increased demand for its Universal vises, Emmert Mfg. Company, Waynesboro, Pa., will shortly begin the erection of an addition to its foundry.

Miscellaneous.

The contract for dredging the south end of Black Rock harbor, Buffalo, has been awarded by the War Department to the Empire Engineering Corporation, New York, at its bid of \$603,154.20, the lowest of eight bids submitted.

Stockholders of the Forsyth Pattern Company, Youngstown, Ohio, have elected William Rudge president and general manager; F. D. Runser, vice-president, and W. H. Parks, treasurer.

The American Waltham Watch Company, Waltham, Mass., proposes to extend one of its large wings to give a considerable addition to the manufacturing capacity of the great works. Arrangements have also been made for the reorganizing of the power plant.

The Engineering of Light & Illuminating Company, of which Arthur A. Ernst, 25 Broad street, New York, is interested, has incorporated with a capital stock of \$20,000 and will devote itself principally to the engineering of light.

The Milwaukee Solvay Coke Company has been incorporated at Milwaukee, Wis., by Henry J. and Armin A. Schlesinger and Edgar U. Dickson, to act as the selling agent for the Milwaukee Coke & Gas Company in its local sale of coke for domestic use. By the middle of February the Milwaukee Coke & Gas Company will have its additional 80 ovens in operation giving it a total of 160 ovens with a daily capacity of 1200 tons of coke.

The Portland Cement Company, Portland, Colo., has authorized an expenditure of \$115,000 for improvements which will increase the capacity of its plant to about 1500 barrels per day. The machinery included in the specifications, some of which has already been purchased, consists of a 1200 horsepower Corliss engine, 500 kw. generator, two Heine boilers, Wheeler condenser, Wainwright heater, pumps, hot wells, several Smith tube mills, motors, &c.

The Western Valve Company, Chicago, has increased its capital stock from \$40,000 to \$100,000 by reason of greatly increased business.

Isaac Hutchison of Mexico City and D. F. Reid of Hutchison, the former president of the Mexican Car & Foundry Company and the latter assistant manager, have been in Memphis and New Orleans the last few days. The gentlemen were buying material for car construction. The site of the shops near Mexico City has been named Hutchison in honor of the president of the company. The company is building at the plant about ten freight cars per day. Heretofore all the cars used in Mexico were imported from Europe and the United States.

Capitalists of Elyria, Ohio, have organized the Perry-Fay Mfg. Company with a capital stock of \$300,000 for the manufacture of brass, steel and iron nuts, screws and special parts that enter into the manufacture of automobiles and fine machinery. A new plant will be erected which will be equipped with modern automatic machinery and the company hopes to have it in running order within a few months. R. D. Perry and W. N. Fay, who are now with the Western Automatic Machine Screw Company, will be at the head of the company, and W. G. Sharp and A. L. Garford are among the stockholders.

The Struthers Coal & Coke Company, an identified interest of the Struthers Furnace Company, Struthers, Ohio, has put in operation 20 coke ovens at its plant in the Klondike region, Pennsylvania. It expects to build 140 more ovens, work on which will start in a short time. The slag cement plant of the Struthers Furnace Company, at Struthers, is in full operation and the plant is operating very successfully. New machinery has recently been installed, which has considerably increased the capacity and added to the efficiency of the plant. The company has orders for all the cement that it can possibly furnish and is sold up for some time ahead.

The Bessemer Coke Company, Lewis Building, Pittsburgh, has recently bought a large coal acreage in the Connellsville region, adjoining its Masontown coke plant.

The American Radiator Company is enlarging its Bond plant on Rano street, Buffalo, by the erection of an assembling building, 100 x 200 feet; also a building to be used as a pattern shop, 100 x 175 feet. The buildings will be of steel, concrete and tile construction. Plans for several other buildings are under advisement and work on them will probably be started soon.

The James MacNaughton Company, Buffalo, N. Y., has been incorporated to build electric motors and storage batteries with a capital stock of \$100,000. The directors are: James MacNaughton, Charles S. Chamberlain and M. D. Ashford of Buffalo.

E. & T. Fairbanks & Co., St. Johnsbury, Vt., manufacturers of scales, have purchased the property and business of the Moline Scale Factory, Moline, Ill.

The Iron and Metal Trades

It is true that negotiations for the control of the Hill Ore lands, and for the hauling of the Ore have advanced far, but they are not finally closed.

The markets, generally speaking, are quiet, and in some spots easier. The tonnage of new orders being placed has grown less, chiefly because buyers are well covered far into the year, and because sellers have contracted for their output. Consumption continues at an enormous rate and shipments of Finished Iron and Steel are close to the record, an extraordinary fact in mid-winter. As yet the figures are not complete, but it seems probable that the shipments for January will equal, if they do not exceed, those of October, the highest thus far attained in the history of the Steel Corporation.

The uncertainties in the labor situation in the coal mining industry are causing some consumers to start stocking up Pig Iron and Coke. It must be remembered that the Connellsville, Pocahontas and Alabama coal mines, upon which the Iron industry chiefly relies, are not affected by whatever action the miners' union takes. So far as steam coals are concerned, the Connellsville region may be relied upon to supply what deficiency might occur in the requirements for the leading interest.

The Pig Iron markets show some easing off all around, for forward delivery. This holds good for the Central West in Basic Pig and in Foundry Irons, and, notably, for the lower grades of Southern Iron in the markets which that product reaches. In the East, Steel Irons continue very firm.

A particularly ridiculous story, emanating from this side, seems to have stirred up the English markets. It was to the effect that 30,000 tons of Alabama Pig Iron had been sold for delivery in England, to be shipped in cotton ships. Relative prices abroad and here do not admit of such a movement now.

Nor is there any truth in the reports that the Steel Corporation has recently made large sales of Steel Billets to Europe. The company is confining itself to sales of Finished Material exclusively, not having any crude Steel available. The demand from foreign countries is active.

The Rail makers have thus far taken orders for delivery during 1906 for between 2,400,000 and 2,500,000 tons, exclusive of export sales, with a further constant flow of work. During the week the Kansas City Southern placed 40,000 tons. The orders for the Vanderbilt lines have now been rounded out to a total of 150,000 tons. American mills have during the past week captured some orders for Mexico.

In Chicago the material for one lake vessel requiring about 4000 tons has been placed, and the order for the Shapes and Plates for three more boats, estimated to require about 14,000 tons, are now under negotiation. The largest order for Structural Material placed during the week was for 6500 tons for the Pittsburgh Plate Glass Company in the St. Louis district.

Iron Bars continue to display some weakness.

A Comparison of Prices.

Advances Over the Previous Month in Heavy Type,
Declines in Italics.

At date, one week, one month and one year previous.
Feb. 8, Feb. 1, Jan. 10, Feb. 8,
1906. 1906. 1906. 1905.

FIG IRON:

Foundry No. 2 Standard, Philadelphia	\$18.50	\$18.50	\$18.50	\$17.50
Foundry No. 2 Southern, Cincinnati	16.75	16.75	16.75	16.25
Foundry No. 2, Local, Chicago ..	19.00	19.25	19.25	17.50
Bessemer, Pittsburgh	18.35	18.35	18.35	16.35
Gray Forge, Pittsburgh	17.35	17.35	17.25	15.85
Lake Superior Charcoal, Chicago	20.50	20.50	20.50	18.50

BILLETS, RAILS, &c.:

Bessemer Billets, Pittsburgh ..	26.00	26.00	26.00	23.00
Forging Billets, Pittsburgh ..	32.00	32.00	30.00	25.00
Open Hearth Billets, Phila.	29.00	29.00	30.00	26.00
Wire Rods, Pittsburgh	35.00	34.00	34.00	31.00
Steel Rails, Heavy, Eastern Mill	28.00	28.00	28.00	28.00

OLD MATERIAL:

O. Steel Rails, Chicago	16.00	16.50	16.50	15.50
O. Steel Rails, Philadelphia ..	17.25	17.50	18.25	17.50
O. Iron Rails, Chicago	22.50	23.00	23.00	20.00
O. Iron Rails, Philadelphia ..	23.00	23.50	24.50	23.00
O. Car Wheels, Chicago	19.00	19.00	19.00	16.50
O. Car Wheels, Philadelphia ..	18.75	18.75	18.75	16.00
Heavy Steel Scrap, Pittsburgh ..	16.50	16.75	17.50	16.00
Heavy Steel Scrap, Chicago ..	14.50	14.75	15.00	14.00

FINISHED IRON AND STEEL:

Refined Iron Bars, Philadelphia.	1.83½	1.83½	1.83½	1.63½
Common Iron Bars, Chicago ..	1.75	1.75	1.85	1.65
Common Iron Bars, Pittsburgh ..	1.85	1.80	1.90	1.65
Steel Bars, Tidewater, New York	1.64½	1.64½	1.64½	1.54½
Steel Bars, Pittsburgh	1.50	1.50	1.50	1.40
Tank Plates, Tidewater, New York	1.74½	1.74½	1.74½	1.64½
Tank Plates, Pittsburgh	1.60	1.60	1.60	1.50
Beams, Tidewater, New York ..	1.84½	1.84½	1.84½	1.64½
Beams, Pittsburgh	1.70	1.70	1.70	1.50
Angles, Tidewater, New York ..	1.84½	1.84½	1.84½	1.64½
Angles, Pittsburgh	1.70	1.70	1.70	1.50
Skelp, Grooved Steel, Pittsburgh	1.57½	1.57½	1.55	1.50
Skelp, Sheared Steel, Pittsburgh.	1.60	1.60	1.65	1.55

SHEETS, NAILS AND WIRE:

Sheets, No. 27, Pittsburgh	2.30	2.30	2.30	2.20
Wire Nails, Pittsburgh	1.85	1.85	1.85	1.80
Cut Nails, Pittsburgh	1.80	1.75	1.75	1.80
Barb Wire, Galv., Pittsburgh ..	2.30	2.30	2.30	2.25

METALS:

Copper, New York	17.87½	18.12½	19.00	15.25
Spelter, St. Louis	5.95	6.00	6.45	6.00
Lead, New York	5.75	5.75	5.95	4.55
Lead, St. Louis	5.52½	5.55	6.00	4.35
Tin, New York	36.30	36.75	36.50	29.32½
Antimony, Hallett, New York ..	14.25	14.25	14.25	8.50
Nickel, New York	40.00	40.00	40.00	40.00
Tin Plate, Domestic, Bessemer, 100 pounds, New York	3.69	3.69	3.69	3.74

Chicago.

FISHER BUILDING, February 7, 1906.—(By Telegraph.)

New business in both raw and finished lines continues comparatively light. Pig Iron quotations, both Northern and Southern, declined slightly during the week. Specifications on Finished Material are greatly in excess of mill capacity, but new buying has unquestionably been deferred by consumers on account of the fact that producers are sold so far ahead that reasonable deliveries cannot be promised and the new tonnage on the books of the mills has shown a slight decrease since the first of the year. The Steel for another lake steamer was placed last week, including 4000 tons of Plates and Shapes, and the requirements for three additional steamers, taking 14,000 tons, are now under negotiation. Practically all of the Ship Plates on the books of Western mills have already been delivered and this new tonnage offered is eagerly sought. The American Bridge Company has been awarded the contract for the erection of the buildings for the new plant of the Pittsburgh Plate Glass Company at East St. Louis, aggregating 6500 tons, and the Steel for the Cook County Building, nearly 11,000 tons, will be let before the end of the week. The United States Cast Iron Pipe & Foundry Company closed contracts for 5000 tons of Gas Pipe and 80 tons of Water Pipe for the city of St. Paul, and additional tonnage for gas companies is under negotiation. The Steel shortage in this market is acute and the Illinois Steel Company is drawing on Eastern mills of the corporation to secure sufficient supply to operate its finishing mills. Another blast furnace has also been blown out at its South Works and the shipments of Pig Iron from Ohio furnaces will be increased. The present cold snap has not interfered with Coke shipments into this mar-

ket. Western mills have been placing heavy contracts for Coal to tide them over in the event of a strike of the miners. The Coke production, it is claimed, will not be materially interfered with, as the miners in the Connellsville and Pocahontas fields are not allied with the union. Scrap continues to decline, especially dealers' material, although the railroads are holding out for good prices.

Pig Iron.—The quiet market, which has prevailed in the West for the past two months, has at last brought out lower prices, and both Northern and Southern grades declined 25c. a ton during the week. Northern No. 2 can now be had at \$19, Chicago, and Southern is quoted openly on the basis of \$14, Birmingham, although several producers are holding nominally at \$14.50. A little more inquiry has come out since the first of the month, and the producers feel that present prices are only temporary and that a fair amount of buying will cause the market to react. Three Virginia furnaces are preparing to go on Basic in March, and this will curtail the Foundry Iron offerings from that source. Furnace No. 9 of the South Works of the Illinois Steel Company has been out for repairs and relining, and the Pig Iron output of this plant, already insufficient to meet Steel works requirements, will be further curtailed. Ohio furnaces will be drawn upon to make up this shortage. Two furnaces at the South Works are now out for repairs. We quote at Chicago as follows:

Lake Superior Charcoal.....	\$20.50 to \$21.50
Northern Coke Foundry, No. 1.....	19.50 to 19.75
Northern Coke Foundry, No. 2.....	19.00 to 19.25
Northern Coke Foundry, No. 3.....	18.50 to 18.75
Northern Scotch, No. 1.....	20.00 to 20.25
Ohio Strong Softeners, No. 1.....	20.05 to 20.30
Ohio Strong Softeners, No. 2.....	19.55 to 19.80
Southern Coke, No. 1.....	18.15 to 18.40
Southern Coke, No. 2.....	17.65 to 17.91
Southern Coke, No. 3.....	17.15 to 17.40
Southern Coke, No. 4.....	16.65 to 16.90
Southern Coke, No. 1 Soft.....	18.15 to 18.40
Southern Coke, No. 2 Soft.....	17.65 to 17.90
Southern Gray Forge and Mottled.....	16.15 to 16.40
Malleable Bessemer.....	19.25 to 19.50
Standard Bessemer.....	19.55 to 19.80
Jackson Co. and Kentucky Silvery, 8 %.....	21.30
Jackson Co. and Kentucky Silvery, 8 %.....	22.30
Jackson Co. and Kentucky Silvery, 10 %.....	24.30

Metals.—Quotations on Copper are $\frac{1}{2}$ c. lower, due to increased offerings by some interests. It is claimed that within the next two weeks the greater part of this material will have been disposed of and a higher level of prices again reached. Spelter is off $\frac{1}{4}$ c. and Sheet Zinc a like amount in sympathy. Lead has declined 0.35c. We quote: Casting Copper, 18 $\frac{1}{4}$ c. to 18 $\frac{3}{4}$ c.; Lake, 18 $\frac{1}{4}$ c. to 19c.; Pig Tin, car lots, 38 $\frac{1}{4}$ c. to 38 $\frac{3}{4}$ c.; small lots, 39c. to 40c.; Spelter, prompt delivery, 6 $\frac{1}{2}$ c. to 6 $\frac{3}{4}$ c. for car lots; Lead, Desilverized, 5.65c. to 5.90c. for 50-ton lots; Corroding, 6.15c. to 6.40c. for 50-ton lots; on car lots, 2 $\frac{1}{4}$ c. per 100 pounds higher; Sheet Zinc is \$7.75 list, f.o.b. Laselle in car lots of 600-pound casks. On Old Metals we quote: Copper Wire, 15 $\frac{1}{2}$ c.; Heavy Copper, 15 $\frac{1}{4}$ c.; Copper Bottoms, 14 $\frac{3}{4}$ c.; Copper Clips, 15 $\frac{1}{4}$ c.; Red Brass, 14 $\frac{1}{2}$ c.; Red Brass Borings, 12 $\frac{1}{4}$ c.; Yellow Brass, Heavy, 11 $\frac{1}{4}$ c.; Yellow Brass Borings, 9 $\frac{1}{4}$ c.; Light Brass, 8 $\frac{3}{4}$ c.; Lead Pipe, 5c.; Tea Lead, 4 $\frac{3}{4}$ c.; Zinc, 5c.; Pewter, No. 1, 24c.; Tin Foil, 29c.; Block Tin Pipe, 27 $\frac{1}{2}$ c.

(By Mail.)

Billets.—The scarcity of Rolling Billets continues acute in this district and Eastern mills are making heavy shipments into this market to tide over the finishing mills. Only one producer is offering Forging Billets here at present, and they continue to be held at \$35, f.o.b. Chicago, without the usual extras. Rods are scarce and are quoted at \$36 to \$37, delivered, Chicago.

Rails and Track Supplies.—The Illinois Steel Company has booked no additional tonnage of Standard Section Rails and the indications are that no new tonnage will be taken for this year's delivery before the end of the first half at least. Light Rail tonnage continues heavy, while on Track Supplies this company is out of the market entirely. Track Bolts are higher and prices range from 2.65c. to 2.75c. Work on the erection of the new Light Rail mill at South Chicago has already commenced and it is probable that it will be placed in operation some time this year. Quotations are unchanged, as follows: Angle Bars, accompanying Rail orders, 1906 delivery, 1.50c.; carload lots, 1.75c.; Spikes, 2.10c.; Track Bolts, 2.65c. to 2.75c., base, Square Nuts. The store prices on Track Supplies range from 15c. to 20c. above mill prices. Light Rails, 30 to 45 lb. sections, \$27 to \$28; 25-lb., \$28 to \$29; 20-lb., \$29 to \$30; 16-lb., \$30 to \$31; 12-lb., \$31 to \$32, and lighter Sections down to 8-lb., 38 to \$40, f.o.b. mill. Standard Sections are unchanged at \$28, f.o.b. mill, full freight to destination.

Plates.—The Plate requirements for another lake steamer were placed with the Illinois Steel Company last week, aggregating 1700 tons. Three additional steamers were closed last week by the American Shipbuilding Company, which will represent a total of about 5000 tons of Plates. This business has not yet been placed, but is under negotiation. Prices remain firm and unchanged, as follows: Tank quality,

$\frac{1}{4}$ -inch and heavier, wider than 6 $\frac{1}{4}$ and up to 100 inches wide, inclusive, car lots, Chicago, 1.76 $\frac{1}{2}$ c.; 3-16 inch, 1.86 $\frac{1}{2}$ c.; Nos. 7 and 8 gauge, 1.91 $\frac{1}{2}$ c.; No. 9, 2.01 $\frac{1}{2}$ c.; Flange quality, in widths up to 100 inches, 1.86 $\frac{1}{2}$ c., base, for $\frac{1}{4}$ -inch and heavier, with the same advances for lighter weights; Sketch Plates, Tank quality, 1.86 $\frac{1}{2}$ c.; Flange quality, 1.96 $\frac{1}{2}$ c. Store prices on Plates are as follows: Tank Plate, $\frac{1}{4}$ -inch and heavier, up to 72 inches wide, 2c. to 2.10c.; from 72 to 96 inches wide, 2.10c. to 2.20c.; 3-16 inch up to 60 inches wide, 2.10c. to 2.20c.; 72 inches wide, 2.35c. to 2.45c.; No. 8 up to 60 inches wide, 2.15c. to 2.25c.; Flange and head quality, 25c. extra.

Structural Material.—The shapes for another lake steamer, aggregating 2200 tons, were placed with the Carnegie Steel Company last week and three additional steamers are being figured on requiring over 8000 tons. The contract for the erection of the Cook County Building will be closed this week, the Steel contract to be included in the general letting and will probably be sublet by the general contractors. On Structural Shapes for delivery on the Pacific Coast an advance of \$4 a ton has been made and the new price is 2.35c. delivered. The overland freight from Pittsburgh is 75c. per 100 pounds. Shapes were formerly quoted for this delivery at 1.40c. at the mill. The new price is 1.60c., while the quotation for the rest of the country is 1.70c. Tees take a price a dollar a ton higher, while Beams and Channels over 15-inch are \$2 a ton over this base price. On future shipments mill quotations are as follows: Beams and Channels, 3 to 15 inches, inclusive, 1.86 $\frac{1}{2}$ c.; Angles, 3 to 6 inches, $\frac{1}{4}$ -inch and heavier, 1.86 $\frac{1}{2}$ c.; Angles, larger than 6 inches on one or both legs, 1.96 $\frac{1}{2}$ c.; Beams, larger than 15 inches, 1.96 $\frac{1}{2}$ c.; Zees, 3 inches and over, 1.86 $\frac{1}{2}$ c.; Tees, 3 inches and over, 1.91 $\frac{1}{2}$ c., in addition to the usual extras for cutting to extra lengths, punching, coping, bending or other shop work.

Bars.—Iron Bars continue quiet, and while 1.75c. is not openly quoted, it can readily be done on desirable business. Steel Bar mills continue behind on deliveries from two to three months and heavy shipments continue to be made from stock. The large distributors of Iron Bars have not yet seen fit to reduce their prices from warehouse, notwithstanding the sharp decline in mill quotations in the last few weeks. Pacific Coast deliveries on Bars have been advanced \$2 a ton, or from 2c. to 2.10c. This advance has been made possible on account of the strength of the foreign market and there is little danger now from importation. We make the following quotations: Iron Bars, 1.75c. to 1.80c.; Steel Bars, 1.66 $\frac{1}{2}$ c., both half extras; Hoops, 2.01 $\frac{1}{2}$ c., extras as per Hoop card; Bands, 1.66 $\frac{1}{2}$ c., as per Steel card; Soft Steel Angles and Shapes, 1.66 $\frac{1}{2}$ c., half extras. Store prices are as follows: Bar Iron, 2.20c. to 2.25c.; Steel Bars, 1.85c. and as high as 2c. is asked on certain scarce sizes; Steel Bands, 1.85c. to 1.90c., half extras; Soft Steel Hoops, 2.20c. to 2.25c., full extras.

Sheets.—Mill shipments of both Black and Galvanized Sheets continue exceedingly heavy, and the stocks in the hands of both distributors and consumers are large. Whether the spring demand will be sufficient to absorb this tremendous tonnage is a question, and unless it is greater than heretofore a large portion of the mills will shut down earlier than in preceding years. Quotations are being well maintained, as follows: Blue Annealed, Nos. 9 and 10, 1.86 $\frac{1}{2}$ c. to 1.91 $\frac{1}{2}$ c.; Nos. 16 and 17, 2.06 $\frac{1}{2}$ c. to 2.11 $\frac{1}{2}$ c.; Box Annealed, Nos. 18 to 20, 2.26 $\frac{1}{2}$ c. to 2.31 $\frac{1}{2}$ c.; No. 27, 2.46 $\frac{1}{2}$ c. to 2.51 $\frac{1}{2}$ c.; No. 28, 2.56 $\frac{1}{2}$ c. to 2.61 $\frac{1}{2}$ c.; Galvanized Sheets, Nos. 10 to 14, 2.61 $\frac{1}{2}$ c.; Nos. 17 to 21, 2.86 $\frac{1}{2}$ c.; Nos. 22 to 24, 3.01 $\frac{1}{2}$ c.; Nos. 25 and 26, 3.21 $\frac{1}{2}$ c.; No. 27, 3.41 $\frac{1}{2}$ c.; No. 28, 3.61 $\frac{1}{2}$ c.; No. 30, 4.11 $\frac{1}{2}$ c. Sheets from store: Blue Annealed, Nos. 10 and 11, 2.10c. to 2.20c.; Nos. 12 and 13, 2.15c. to 2.25c.; Nos. 14 and 15, 2.20c. to 2.30c.; No. 16, 2.30c. to 2.40c.; Box Annealed, Nos. 18 to 20, 2.50c. to 2.60c.; Nos. 22 to 24, 2.60c. to 2.70c.; No. 26, 2.65c. to 2.75c.; No. 27, 2.70c. to 2.80c.; No. 28, 2.80c. to 2.90c.; No. 30, 3.25c. to 3.35c. Galvanized from store: Nos. 10 to 20, 3c. to 3.10c.; Nos. 22 to 24, 3.15c. to 3.25c.; No. 26, 3.35c. to 3.45c.; No. 27, 3.55c. to 3.65c.; No. 28, 3.75c. to 3.85c.; No. 30, 4.85c. to 5.05c.

Merchant Pipe.—Prevailing discounts on Black Steel Pipe are now firmly established on the basis of 81, Pittsburgh, one point below the official discounts. Iron Pipe, on the other hand, is strong, and an advance of two points over Steel is readily secured. Demand, although seasonably light, is heavier than at this time last year. Official discounts remain unchanged, however, and are as follows: Black Steel Pipe, 78.35 per cent. on the base sizes $\frac{3}{4}$ to 6 inches, and Galvanized, 68.35 per cent. Iron Pipe is quoted from one and one-half to two points higher. From store in small lots Chicago jobbers are quoting 76 $\frac{1}{2}$ to 77 per cent. on Black Steel Pipe, $\frac{3}{4}$ to 6 inches.

Boiler Tubes.—Heavy demand continues to be limited almost entirely to railroad requirements, other consumers neither specifying nor buying heavily at this time. Prices are unchanged. Official discounts, base sizes, in car lots, are as follows: Steel Tubes, 62.35; Iron, 51.35; Seamless, 50.35; 2 $\frac{1}{2}$ -inch and smaller and lengths over 18 feet, and 2 $\frac{1}{4}$ -inch

and lengths over 22 feet, 10 per cent. extra. Store prices are unchanged, as follows:

	Steel.	Iron.	Seamless.
1 to 1½ inches.....	40	35	42½
1½ to 2¼ inches.....	50	35	35
2¼ inches.....	52½	35	30
2½ to 5 inches.....	60	47½	42½
6 inches and larger.....	50	35	..

Cast Iron Pipe.—The United States Cast Iron Pipe & Foundry Company closed contracts during the last week for approximately 5000 tons of gas pipe from companies at Grand Rapids and Toledo. The contract for the pipe for the city of St. Paul was awarded to Crane & Ordway of that city, their bid being \$30.35 per ton for 4 and 6 inch pipe and \$28.80 for 8, 12, 16 and 20 inch pipe. This material, aggregating 800 tons, will be furnished the contractors by the United States Cast Iron Pipe & Foundry Company. Quotations, notwithstanding the reports of lower prices prevailing for Southern Iron, remain unchanged, as follows: Water Pipe, 4-inch, \$31; 6, 8, 10 and 12 inch, \$30; over 12-inch, \$29, with \$1 extra for Gas Pipe. Large municipal contracts are usually placed at somewhat lower basis.

Merchant Steel.—Implement manufacturers are generally booked through the first half of this year and no contracts of importance are being placed for immediate delivery. Practically all of the shafting business was placed before the first of the year, although a small tonnage is now being closed. The market is without loss of strength and quotations are firmly maintained, as follows: Planished or Smooth Finished Tire Steel, 1.70c.; Iron Finish up to 1½ x ½ inch, 1.65c., and Iron Finish, 1½ x ½ inch and larger, 1.50c., base, Pittsburgh, and Channels for solid rubber tire are quoted as follows: ¾, ¾ and 1 inch, 2c., and 1½ inch and larger, 1.90c., Pittsburgh; Smooth Finished Machinery Steel, 1.91½c.; Flat Sleigh Shoe, 1.71½c.; Concave and Convex Sleigh Shoe, 1.86½c.; Cutter Shoe, 2.40c.; Toe Calk Steel, 2.21½c.; Railway Spring, 1.86½c.; Crucible Tool Steel, 6½c. to 8c.; special grades of Tool Steel, 13c. and up; Shafting, 50 per cent. discount on car lots and 45 per cent. in less than car lots, in base territory.

Coke.—The severe weather which has just set in has not yet prevented heavy consignments from coming into this market and low prices are prevailing on Foundry Coke for immediate delivery. Strictly Connellsville Coke continues to be quoted at \$2.50 to \$2.75 on track, equivalent to \$5.15 to \$5.40 Chicago. On the other hand, producers of by-product Coke are holding their prices at a minimum and are willing to close for the remainder of the first half on this basis. On account of the low prices prevailing for Connellsville material, few foundrymen have as yet contracted their future requirements. The threatened coal strike will not interfere with the production of Coke in the Connellsville region, as the miners in that region are not affiliated with any unions, nor will the production of Coke in the West Virginia field be interfered with for this same reason, and higher prices in Coke can be looked for notwithstanding the advances made in the last few days by coal shippers. Western mills are already contracting for coal supply to be stocked before April 1 that will last them over a period of 30 to 60 days.

Old Material.—A wide range of prices is being named on Old Material and there is quite a difference between quotations made by the railroads and prices named by dealers. No. 1 Railroad Wrought was sold last week by one railroad at \$17.85, while a dealer this week, being compelled to dispose of a car on track, sacrificed it at \$15.85. The railroads, on the other hand, are not sacrificing their material and will only sell when offered what they consider fair prices. The Santa Fé road will dispose of about 3000 tons on Wednesday, this being the largest list that has been issued by any railroad for some time. Prices generally are weaker, especially on dealers' material. The present cold snap may to some extent steady the market, but this is doubted as consumers generally have heavy stocks on hand and in sufficient quantity to tide them over for at least a month. The range of prices paid by large consumers to producers and dealers, car lots, f.o.b. Chicago, is as follows:

Old Iron Rails.....	\$22.50 to \$23.00
Old Steel Rails, 4 feet and over.....	16.50 to 17.00
Old Steel Rails, less than 4 feet.....	16.00 to 16.50
Heavy Relaying Rails, subject to inspection.....	27.00 to 27.50
Old Car Wheels.....	19.00 to 19.50
Heavy Melting Steel Scrap.....	14.50 to 15.00
Frogs, Switches and Guards.....	15.00 to 15.50
Mixed Steel.....	13.00 to 13.25

The following quotations are per net ton:

Iron Fish Plates.....	\$19.00 to \$19.50
Iron Car Axles.....	23.50 to 24.00
Steel Car Axles.....	21.00 to 21.50
No. 1 Railroad Wrought.....	16.50 to 17.50
No. 2 Railroad Wrought.....	15.50 to 16.50
Locomotive Tires, smooth.....	14.25 to 14.50
Railway Springs.....	14.50 to 15.00
No. 1 Dealers' Forge.....	12.50 to 13.00
Wrought Pipes and Flues.....	11.25 to 11.50
Mixed Busheling.....	11.00 to 11.50
Iron Axle Turnings.....	12.00 to 12.50
Soft Steel Axle Turnings.....	12.00 to 12.50
Machine Shop Turnings.....	12.00 to 12.50
Cast Borings.....	10.00 to 10.50
Mixed Borings, &c.....	10.00 to 10.50
No. 1 Mill.....	9.50 to 10.00
No. 2 Mill.....	8.00 to 8.50
No. 1 Boilers, cut to Sheets and Rings.....	11.00 to 11.50

No. 1 Cast Scrap.....	14.00 to 14.50
Stove Plate and Light Cast Scrap.....	12.00 to 12.50
Railroad Malleable.....	14.00 to 14.50
Agricultural Malleable.....	13.50 to 14.00

Philadelphia.

REAL ESTATE TRUST BUILDING, February 6, 1906.

The tone of the Iron market is less strong than it has been, although there is no quotable change in prices. Buying was unusually heavy during the past couple of months, so that a slight falling off in the demand is only about what might be expected. Still there is undoubtedly a less optimistic feeling in regard to the future, and in some lines it would not be difficult to place orders at less money than would have been accepted a week or two ago. This tendency is liable to become more general in course of the next few weeks, although there is nothing intrinsically weak in the situation. As a matter of fact, there is much that is strong, but a breathing spell has to be taken once in a while, and it is just possible that it may continue until the business atmosphere becomes clearer than it is at the present time. There are some features that are not altogether favorable, but, as every one knows, there are others that ought to sustain the market well through 1906. It is a critical period and improvement or the reverse will depend upon developments during the next four or five weeks. The market cannot be supported without an adequate supply of orders, and whether these will be in sufficient volume to replace the outgoings is the problem that must be solved within the period named. There is little or nothing to be desired in present conditions beyond those that already exist, but the Iron and Steel trade is based largely on the future, and it is that to which reference is made. The first half of the year is largely provided for and the third quarter is to some extent, but buyers are not as anxious to buy for six or eight months ahead as they were to buy for the same distance ahead during the late months of 1905. Moreover, some who declined business for finished products to be delivered during the last half of this year are now ready to accept orders for a shade less money. This does not necessarily imply that prices will be lower, but it is a fairly good indication of the feeling at this time. The pause in the demand may be only temporary, but for the time being it undoubtedly exists.

Pig Iron.—The market is a little irregular, and appears to be "halting between two opinions." In some directions it looks strong; in others prices are decidedly easier, so that strength at one end is offset by weakness in other directions. There is no question in regard to Steelmaking Irons, which are scarce, and for early deliveries are firmer than ever, February shipments having been taken at something over \$18, delivered, the highest figure yet realized. Foundry Irons are steady, but grades below that are rather weak and in some instances have been shaded quite sharply for prompt shipments. Taking it as a whole, however, the market is less "snappy" than it was and there is an evident disposition to assume a conservative position until there are some pretty clear indications as to the amount of business likely to be done during the spring and summer months. As far as regards the present, there is no lack of activity anywhere. The only change in the situation is that the desire to buy for deliveries during later months of the year is not as strong as it was. Furnaces are very short of Basic Iron and it is a continual struggle to keep up with the demand for immediate shipments. Under such conditions furnaces can get nothing ahead, so that there is practically no reserve to fall back on and the way things are moving the chances in that direction are anything but favorable. A decrease in consumption appears to be the only thing to help them out and that is neither probable nor desirable. There may be a chance of relief by switching furnaces from Foundry to Basic, but there is nothing definite in that respect, although it is not unlikely that this may be done if the stringency is likely to continue much longer. Prices are not quotably changed, except Gray Forge, which is a little easier, the range for Philadelphia and nearby deliveries being as follows:

No. 1 X Foundry.....	\$19.00 to \$19.50
No. 2 X Foundry.....	18.50 to 18.75
No. 2 Plain.....	17.75 to 18.25
No. 2 Southern.....	18.75 to 19.00
Standard Gray Forge.....	16.50 to 17.00
Basic.....	18.00 to 18.10
Low Phosphorus.....	24.50 to 25.50
Bessemer.....	19.50 to 19.75
Malleable Iron.....	19.00 to 19.25

Steel Alloys.—The situation seems to be a little easier temporarily, although there is nothing very encouraging in the outlook. Two leading companies in the west of England are figuring on getting to work on 80 per cent. Ferro in course of a few weeks, but in the meanwhile spot stuff is very scarce. Prices are very erratic, but the following inside quotations would probably be accepted for the last half of the year, and the outside asked for first or second quarter:

Silico Spiegel, 10 and 18 per cent.....	\$44.00 to \$55.00
Ferrosilicon, 50 per cent.....	100.00 to 110.00
Spiegeleisen, 20 per cent.....	38.00 to 45.00
Ferromanganese, 80 per cent.....	110.00 to 150.00

Muck Bars.—There is little or no demand. Nominal quotations are from \$28 to \$29 at seller's mill, price according to quality.

Steel.—The demand is fair, but the bulk of the business has been taken at \$29 delivered. The tonnage is quite heavy, but has been confined to large orders; small lots held at about \$30 and Forging Steel at \$35 to \$40.

Plates.—Business holds up very well and mills see their way to great activity until midsummer and possibly much beyond that. Specifications come in freely, so that the output is very heavy and is well taken care of. Prices are as follows:

	Carload. Cents.	Part carload. Cents.
Tank, Bridge and Boat Steel.....	1.73½	1.78½
Flange or Boiler Steel.....	1.83½	1.88½
Marine, A. B. M. A. and Commercial		
Fire Box Steel.....	1.93½	1.98½
Marine.....	2.13½	2.18½
Locomotive Fire Box Steel.....	2.23½	2.28½
The above are base prices for ¼-inch and heavier. ing extras apply:		
		The follow- Extra per 100 pounds.
3-16-inch thick.....		\$0.10
Nos. 7 and 8, B. W. G.....		.15
No. 9, B. W. G.....		.25
Plates over 100 to 110 inches.....		.05
Plates over 110 to 115 inches.....		.10
Plates over 115 to 120 inches.....		.15
Plates over 120 to 125 inches.....		.25
Plates over 125 to 130 inches.....		.50
Plates over 130 inches.....		1.00

Structural Material.—There is a great deal of business coming out, and while the output is becoming larger almost every week it is still difficult to get anything like satisfactory deliveries. The increased production is sure to make itself felt in the long run, however, so that the old mills are doing everything possible to make prompt shipments. Prices unchanged, as follows: Beams, Channels and Angles, 1.83½c. to 2c., delivered.

Bars.—The Bar Iron trade, and to some extent Steel Bars also, is not as lively as it was before the holidays. New business is scarce and it would require special inducements before a large order could be landed. Deliveries are satisfactory, but the incomings are not sufficient to offset the outgoing. Consequently prices are inclined to ease off. First-class Refined is still quoted at 1.83½c., but for a good sized order and desirable sizes buyers expect to do a half-tenth better, if not more than that. Steel Bars are not quotably lower, but they are easier and have lost most of the premium that has been exacted for quick shipments.

Sheets.—The market is dull and prices are somewhat easier, although the asking prices are as follows for small and medium sized lots: Nos. 18 to 20, 2.40c.; Nos. 22 to 24, 2.50c.; Nos. 25 to 26, 2.60c.; No. 27, 2.70c., and No. 28, 2.80c.

Old Material.—The situation does not improve as regarded from a seller's point of view. Mills have their yards full of Scrap, and in many cases they are under an embargo, so that they have no disposition to make new engagements. It is difficult to do more than give an outline of quotations, but the following are a fair average of bids and offers for deliveries in buyers' yards:

Scrap Steel Rails.....	\$17.25 to \$17.50
No. 1 Steel Scrap.....	16.50 to 17.25
Low Phosphorus Scrap.....	23.00 to 24.00
Old Steel Axles.....	20.00 to 21.00
Old Iron Axles.....	26.50 to 27.50
Old Iron Rails.....	23.00 to 24.00
Old Car Wheels.....	18.75 to 19.00
Choice Scrap, R. R. No. 1 Wrought.....	20.00 to 21.00
No. 1 Yard Scrap.....	18.00 to 19.00
Long and Short.....	17.50 to 18.00
Machinery Scrap.....	16.00 to 16.50
Wrought Iron Pipe.....	15.00 to 15.50
No. 1 Forge Fire Scrap.....	16.00 to 16.50
No. 2 Light Ordinary.....	12.00 to 12.50
Wrought Turnings.....	14.00 to 14.50
Axle Turnings, Choice Heavy.....	15.00 to 15.50
Cast Borings.....	10.50 to 11.00
Stove Plates.....	13.00 to 13.50
Grate Bars.....	12.50 to 13.00

The Wilmington Iron Company, Wilmington, Del., manufacturer of Standard Refined Bar Iron, will operate the plant formerly owned by the Johnson Forge Company. Extensive alterations and improvements have been made and new machinery installed and it is expected that the plant will be ready for operation some time this week. C. H. Zehnder is president; W. D. Zehnder, vice-president; E. M. Zehnder, assistant to president; A. C. McFarland, secretary; W. G. Williams, sales agent, and George H. Catterall, superintendent.

A new method of transportation has been instituted between Las Vegas, Bullfrog and Goldfield, in Nevada, in which 12 automobiles are employed in place of the former wagons drawn by ox teams. The line is taxed to its utmost capacity, being operated in two divisions, at a price per passenger which would make New York rapid transit magnates rub their hands with glee. From Las Vegas to Bullfrog, a distance of 124 miles, the trip is made in 14 hours and the fare is \$40. For the distance between Bullfrog and Goldfield, 70 miles, the fare is only \$25.

Pittsburgh.

PARK BUILDING, February 7, 1906.—(By Telegraph.)

Pig Iron.—While the general demand for Pig Iron is quiet, furnacemen report that consumers are specifying very freely on contracts and are taking Iron in promptly. It is known that a number of leading consumers will soon be in need of Iron and a better buying movement is expected to set in toward the close of this month. Bessemer Iron continues quite firm, being held at \$17.50 minimum, Valley furnace, and we note a sale of 1500 tons for February and March shipment at that price. Some sales of small lots are reported at \$17.75, Valley furnace. There is a fair inquiry for Foundry Iron, Northern brands being held at \$17.25 to \$17.50, Valley furnace, or \$18.10 to \$18.35, Pittsburgh. Forge Iron is firm, Northern brands being held at \$16.50, at furnace, or \$17.35, Pittsburgh. Southern Forge is not quite so firm, and is held at about \$12.75, Birmingham, or \$17.10, Pittsburgh. Effective March 1, rates on Southern Pig Iron from the Birmingham district to Pittsburgh will be advanced from \$4.35 to \$4.50 a ton.

Steel.—There is not much inquiry for Steel, most leading consumers being covered by contracts. Bessemer Billets are held at \$26 to \$26.50, and Open Hearth Billets at about \$27. Pittsburgh Sheet and Tin Bars in random lengths to consumers who have contracts with the leading interest are \$27, delivered to mills in the Pittsburgh district, while to outside mills actual rate of freight from Pittsburgh to point of delivery is charged. For Cut Bars the price is 50c. a ton additional.

(By Mail.)

About the only unfavorable feature in the Iron trade at the present time is the threatened strike of the coal miners. Many of the largest consumers of coal, including the United States Steel Corporation and other large Steel interests, have been steadily accumulating stocks of fuel at their different plants for some months and it is said that some have enough piled up to keep them running for two months or longer in case of a strike. It is most earnestly hoped that it will be averted, as it would have a very serious effect on general business. The amount of new business being placed in both raw and finished materials is much less than for some time. This is not due entirely to uneasiness in the minds of consumers as to the future, but rather from the fact that they are covered for some time ahead. In the meantime the mills are as busy as ever and are still somewhat behind on deliveries, especially on Structural Steel, Plates and Steel Bars. There is a fair amount of inquiry for Pig Iron, but mostly for small lots. Prices are firm on Bessemer, which is held at \$17.50, minimum Valley furnace, while \$17.75 is being paid for small lots. Basic Iron is quoted at \$17, Valley furnace, but this price might be shaded on a firm offer. There is a moderate inquiry for Foundry Iron and some furnaces that are well sold up are holding Northern No. 2 at \$17.50 at furnace. Other sellers would accept \$17.25 and perhaps slightly less for a good round tonnage. Northern Gray Forge is firm at \$16.50, Valley furnace, or \$17.35, Pittsburgh, with some sellers asking 25 cents more. Coke and Scrap continue weak, new demand being very dull.

Ferromanganese.—Sales of from 50 to 60 tons of 80 per cent. Ferro for spot delivery are reported as having been made the past week at about \$150 a ton, delivered. For delivery in February and March about \$125 a ton is quoted, while for shipment over the last six months of the year \$90 to \$100 a ton is asked, and it is said that some good sized contracts have been made at these prices, especially by Eastern consumers.

Muck Bar.—We note some inquiry for Muck Bar and best local grades made from all Pig Iron are held at \$31.75 to \$32, Pittsburgh. Eastern mills are offering Bar in this market at lower prices. A new producer of Muck Bar in the Pittsburgh district is the Shenango Iron & Steel Company of this city, whose puddling furnaces and Muck Bar mill at Wheatland, Pa., were started last week.

Steel Rails.—Heavy orders for Steel Rails continue to be placed, the mills having booked fully 75,000 tons in the past week. The trolley lines are also placing a large tonnage, one Western road having recently given out a contract for 12,000 tons. A fair tonnage is being placed in Light Rails, prices on which are quite firm and which we quote: 8-lb., \$36; 10-lb., \$32; 12-lb., \$30; 16-lb., \$29; 20-lb., \$28.50; 25 to 45 lb., \$27.50 to \$28, maker's mill.

Rods.—Both Bessemer and Open Hearth Rods for prompt delivery are very scarce, and it is said upward of

\$35 has been paid for Bessemer Rods for prompt shipment. Open Hearth Chain Rods are held at \$35, Pittsburgh.

Skelp.—The mills rolling Skelp are very busy on contracts on which they are very much behind in deliveries. Prices are firm, and we quote: Grooved Steel Skelp, 1.57½c. to 1.60c.; Sheared Steel Skelp, 1.60c. to 1.65c.; Grooved Iron Skelp, 1.70c. to 1.75c., and Sheared Iron Skelp, 1.80c. to 1.85c., Pittsburgh. These prices are for ordinary widths and gauges.

Structural Material.—There is a steady stream of contracts coming into the mills, and the outlook for the trade for 1906 could not be better, the leading interests being practically filled up with work for all of this year. The American Bridge Company has taken about 3500 tons of Steel for the new buildings of the Pittsburgh Plate Glass Company, Crystal City, Mo. Deliveries from the mills are still unsatisfactory, especially on Open Hearth Steel. The new Structural mill of the Jones & Laughlin Steel Company will be ready about March 1, and will have a monthly capacity of about 8000 tons of the medium sizes of Structural Shapes. This mill is being built in record breaking time, and would probably have been ready now had it not been for the delay in getting the steam piping finished. Prices continue very firm, and we quote: Beams and Channels, up to 15-inch, 1.70c.; over 15-inch, 1.80c.; Angles, 3 x 2 x ¼ inch thick up to 6 x 6 inches, 1.75c.; 8 x 8 and 7 x 3½ inches, 1.80c.; Zees, 3-inch and larger, 1.70c.; Tees, 3-inch and larger, 1.75c. Under the Steel Bar card Angles, Channels and Tees under 3-inch are 1.60c., base, for Bessemer and Open Hearth, subject to half extras on the Standard Steel Bar card.

Plates.—New business in Plates is only of fair volume, while specifications on contracts are lighter than for some time. Some of the smaller mills, especially the Eastern ones, are now able to promise deliveries in two weeks, a condition that has not existed in the Plate trade for some months. The shipbuilding yards are taking a large tonnage in Plates, but no new business from this source is in sight. On the smaller sizes of Plates a few of the outside mills are shading prices slightly on desirable orders. We quote: Tank Plates, ¼ inch thick, 6¼ up to 100 inches in width, 1.60c., base, at mills, Pittsburgh. Extras over the above prices are as follows:

	Extra per 100 pounds.
Gauges lighter than ¼-inch to and including 3-16-inch Plates on thin edge.....	\$0.10
Gauges Nos. 7 and 8.....	.15
Gauge No. 9.....	.25
Plates over 100 to 110 inches.....	.05
Plates over 110 to 115 inches.....	.10
Plates over 115 to 120 inches.....	.15
Plates over 120 to 125 inches.....	.25
Plates over 125 to 130 inches.....	.50
Plates over 130 inches.....	1.00
All sketches (excepting straight taper Plates varying not more than 4 inches in width at ends, narrowest end being not less than 30 inches)....	.10
Complete Circles.....	.20
Boiler and Flange Steel Plates.....	.10
Marine, "A. B. M. A.".....	.40
Still Bottom Steel.....	.30
Locomotive Fire Box Steel.....	.50
Shell Grade of Steel is abandoned.	

TERMS.—Net cash 30 days. For anticipated payments a maximum discount may be allowed at the rate of 6 per cent. per annum and for a longer time than 30 days interest shall be charged at the same rate per annum. Invoices paid within ten days from date thereof, discount of ½ of 1 per cent. is allowable. Pacific Coast base, 1.60c., f.o.b. Pittsburgh, with all rail tariff rate of freight to destination added, no reduction for rectangular shapes 14 inches wide down to 6 inches of Tank, Ship or Bridge quality.

Sheets.—The demand for Sheets is only fair, but buyers are specifying very freely on the large contracts placed last fall, when low prices were ruling. The Sheet mills are quite busy on contracts and some of the larger mills are not able to promise deliveries on new tonnage inside of three months or longer. Prices are fairly strong, and we quote: Black Sheets, Box Annealed, one pass through cold rolls, Nos. 10 to 12 gauge, 2c.; Nos. 13 and 14, 2.05c.; Nos. 15 and 16, 2.10c.; Nos. 17 to 21, 2.15c.; Nos. 22 to 24, 2.20c.; Nos. 25 and 26, 2.25c.; No. 27, 2.30c.; No. 28, 2.40c.; No. 29, 2.55c., and No. 30, 2.65c. Galvanized Sheets: Nos. 10 and 11, 2.35c.; Nos. 12 to 24, 2.45c.; Nos. 16 and 16, 2.55c.; Nos. 17 to 21, 2.70c.; Nos. 22 to 24, 2.85c.; Nos. 25 and 26, 3.05c.; No. 27, 3.25c.; No. 28, 3.45c.; No. 29, 3.70c. and No. 30, 3.95c. We quote No. 28 Gauge Painted Roofing Sheets at \$1.65 per square and Galvanized Roofing Sheets, No. 28 gauge, at \$3 per square for 2½-inch corrugations. Jobbers charge the usual advances over these prices for small lots. On a desirable order it is possible that some mills might shade the above prices about \$1 a ton.

Bars.—Some of the mills that roll the finer grades of refined Iron Bars state that the weakness in prices referred to last week is confined to Common Iron Bars. New tonnage is fairly large and the mills are quite busy on contracts and somewhat behind in shipments. The same conditions apply in Steel Bars, for which new demand is fair, but the mills are very heavily booked with contracts on which they are some weeks behind in deliveries. We quote Steel Bars at 1.50c., base, for half extras, for carloads and larger lots, while Refined Iron Bars of best grades are held at 2c.

and Common Iron Bars, rolled from part Scrap, are held at 1.85c., Pittsburgh.

Hoops and Bands.—Specifications on contracts are coming in very freely, but new tonnage is light. We quote Steel Hoops at 1.85c. and Bands to be used for coopeage purposes at 1.85c., the latter carrying full Hoop and Band extras. Bands for other than coopeage purposes are 1.50c., base, half extras, as per Standard Steel card. Above prices are for carload lots, f.o.b. Pittsburgh, plus full tariff rail rate to point of delivery.

Tin Plate.—New demand for Tin Plate is rather quiet, but most of the mills are heavily sold up on contracts taken some time ago, before the advance in prices. We quote \$3.50 per base box, f.o.b. Pittsburgh, for 14 x 20 100-lb. Cokes, terms 30 days, less 2 per cent. off for cash in 10 days. Some mills allow a rebate of 5c. a box on the above price to the large trade.

Merchant Steel.—A moderate amount of new work is being placed, but the mills are running mostly on old contracts, on which buyers continue to specify very freely. The market on Steel Shafting is quite firm and it is understood that dealers have made an agreement by which they pledge themselves to sustain prices. The mills report that official mill prices are being rigidly held. Prices are firm and we quote: Planished or Smooth Finished Tire Steel, 1.70c.; Iron Finish up to 1½ x ½ inch, 1.65c., and Iron Finish, 1½ x ½ inch and larger, 1.50c., base, Pittsburgh, and Channels for solid rubber tire are quoted as follows: ¾, ½ and 1 inch, 2c., and 1½-inch and larger, 1.90c.; Toe Calk Steel, 2c. to 2.05c.; Railway Spring Steel, 1.65c. to 1.70c.; Cutter Shoes, 2.20c. to 2.25c.; Flat Sleigh Shoe, 1.50c. to 1.55c.; Crucible Tool Steel, 6c. to 8c. for ordinary grades and 12c. and upward for special grades.

Railroad Spikes.—The demand continues quite heavy. The Erie Railroad is in the market for 23,000 kegs of Spikes, and it is certain that a good part of this business will be taken by Pittsburgh mills. We quote Railroad Spikes at \$2 to \$2.05 per 100 pounds, f.o.b. Pittsburgh.

Spelter.—Consumers of Spelter are pretty well covered for some time and are not in the market, consequently new demand is quiet. Prices have gone off sharply and Prime grades of Western Spelter are very weak at 6c., St. Louis, equal to 6.12½c., Pittsburgh. On a firm offer this price would be shaded.

Merchant Pipe.—We note a seasonable demand for Merchant sizes of Pipe and the mills are booking a good deal of tonnage and are pretty well sold up for several months ahead. There is no change in prices, which are very low in comparison with cost of Plates, the extreme discount to the largest trade being about 81 per cent. off. Official discounts are as follows:

		Merchant Pipe.							
		Jobbers, carloads.		Consumers, carloads.					
		Steel.		Iron.		Steel.		Iron.	
		Blk. Galv.	Blk. Galv.	Blk. Galv.	Blk. Galv.	Blk. Galv.	Blk. Galv.	Blk. Galv.	Blk. Galv.
¾ and ¾ inch.....	72	58	69½	53½	71	53	68½	52½	
1 inch.....	74	66	73½	61½	73	59	72½	60½	
1½ inch.....	76	64	73½	61½	75	63	72½	60½	
2 to 6 inches.....	80	60	78	68	79	69	77	67	
7 to 12 inches.....	75	60	73	57½	74	59	72	56½	
Extra strong, plain ends:									
¾ to ¾ inch.....	65	53	62½	50½	64	52	61½	49½	
1 to 4 inches.....	72	60	69½	57½	71	59	68½	56½	
4½ to 8 inches.....	68	56	65½	53½	67	55	64½	52½	
Double extra strong, plain ends:									
¾ to 8 inches.....	61	50	58½	47½	60	49	57½	46½	

Boiler Tubes.—The demand from railroads continues heavy, but from other large consumers of Tubes is very light. Prices continue low, and the mills that have to buy Skelp in the open market are probably below actual cost of production. We quote:

		Boiler Tubes.			
		Iron.		Steel.	
1 to 1½ inches.....		41	46		
1½ to 2½ inches.....		41	58		
2½ inches.....		46	60		
2½ to 5 inches.....		53	66		
6 to 13 inches.....		41	58		

Iron and Steel Scrap.—The demand for Scrap is rather light, and the general market is soft. Some time ago some of the leading consumers shut off shipments for a time and this caused a good deal of Scrap to accumulate in the hands of dealers. This material having to be removed, relatively low prices are being made on it to consumers who will agree to take it in at once. We quote: Heavy Melting Stock, \$16.50 to \$16.75; No. 1 Wrought Scrap, \$19.50 to \$20; Cast Iron Borings, \$10; Bundled Sheet Scrap, \$14.75 to \$15; Old Steel Rails, short pieces, \$16.50; long pieces for re-rolling, \$18; Machinery Cast Scrap, \$15.50 to \$15.75; Cast Steel Scrap, \$15.75 to \$16; Steel Turnings, \$13.75 to \$14; Old Car Wheels, \$18.50, and Old Iron Rails, \$24 to \$24.50, all in gross tons, f.o.b. Pittsburgh.

Coke.—Prices on Coke for prompt shipment continue to decline and consumers who will agree to take in either Furnace or Foundry Coke promptly can almost name the figures they will play for it. Strictly Connellsville Furnace Coke is offered as low as \$2.10 to \$2.20 a ton and 72-hour Foundry

at \$2.60 a ton at oven. The output of Coke continues heavy. Of 29,829 ovens in the Upper and Lower Connellsville regions only 1187 were idle last week, and the output of both regions was 379,043 tons. Some grades of Coke made outside the Connellsville region are being offered as low as \$1.50 for Furnace and \$2.25 for Foundry for prompt shipment.

Cleveland.

CLEVELAND, OHIO, February 6, 1906.

Iron Ore.—In view of the feeling of unrest in the labor situation, the lake vessel interests are taking more seriously into account the possibility that the lake labor unions may make demands this spring which may postpone the opening of navigation. The tugmen and tug managers will get together the latter part of this month for a discussion of wages; the longshoremen and the dock managers will meet early in March, and the Lake Carriers' Association and the labor unions toward the middle of March. The quarter in which the uneasiness is especially felt is the longshoremen's conference, the men being disposed to demand that more be employed on the unloading machines. There is also believed to be a possibility that the lake masters and pilots will resume the demand for a recognition of their union. No new sales of Ore nor new contracts for carrying Ore have been reported during the week. The contract rates of carriage remain 75c. from the head of the lakes, 70c. from Marquette and 60c. from Escanaba. Ore prices remain at \$4.25 f.o.b. Lake Erie ports for base quality Old Range Bessemer; \$4 for Mesaba Bessemer; \$3.70 for Old Range non-Bessemer and \$3.40 to \$3.50 for Mesaba non-Bessemer.

Pig Iron.—The Foundry Iron market is quiet. Most of such buying as is now being done is for spot shipment. This is limited, which is due to the fact that there is very little Iron to be had. It is in fact confined to the supply of two or three furnaces in this immediate territory which had not sold up their full capacity on contract. Buyers are using every effort to place business for future delivery on a lower level of prices. While the furnaces are still quoting No. 2 Iron at \$17.50 in the Valleys, some has been sold on the basis of \$17.25, the reduction being made more in the matter of freight rates than in any lowering of the price at the furnace, the location of the furnace giving the producer more than \$17.50 in the furnace yard. This has seemed to break the price without really doing so. Inquiries are heavy. The coke market continues weak, but the sudden change in the weather, promising a restriction of railroad facilities, is expected to give some new strength in a short time.

Finished Iron and Steel.—In some instances deliveries are a little more prompt, certain lines being a little freer, but this has not amounted so far to any easing of the situation. Sheets are in relatively better demand than other products. The mills have been practically filled up for some time. In addition a new demand is springing up in this market which is throwing the surplus business on the jobbers to be taken care of. This has resulted in a shift in the stock prices, making a slight advance. Jobbers are now quoting No. 10 Black Sheets, 2.15c.; No. 16, 2.35c.; Nos. 18-20, 2.45c.; No. 28, one pass cold rolled, 2.70c. and No. 28 Galvanized, 3.70c., all being base quotations. In Structural Shapes the inclement weather has not so far checked outside construction and the demand is still good. In many quarters the demand for immediate use has sent the consumers to the smaller mills and premiums of \$5 to \$10 are being paid over the association price of 1.70c., Pittsburgh. It is reported in marine circles that three new lake ships are to be ordered in the near future. One of the old contracts has been allowed to lapse, due to lack of the proper financial support. In Plates one or two of the smaller mills have a limited number of sizes to sell for quick shipment, but the equipment of the mills making such offers is not such as to permit them to accept a contract with broad specifications required. On the other hand one or two of the Eastern mills are still getting orders at premiums for immediate delivery. The lots which have been sold have been mostly small, ranging from 100 to 200 tons. In Bars the situation is comparatively easy. The market is not soft but the mills are in position to take more orders. They can promise delivery on a general specification in 30 to 60 days. Prices are steady at 1.50c., Pittsburgh, for Bessemer and Open Hearth Bars. The Bar Iron situation is a little stronger, with very little being offered and prices holding at 1.70c. to 1.80c. at the mills, Youngstown. Billets are easier as to price, but the supply is not materially increased. A few more mills are quoting. Bessemer Billets sell at \$25 to \$28, Pittsburgh, while Open Hearth and Forging Billets are quoted at \$28, Pittsburgh.

Old Material.—The open weather of the past few weeks has caused something of a congestion in the Scrap market, the result of which is slightly lower prices. Some few holders have been willing to sacrifice their material to keep it moving, but strong hopes are expressed of a turn in the

market due to the heavy snowfall of the past few days. Prices are revised and quoted, gross tons: Old Steel Rails, \$16.50 to \$17.50; Old Iron Rails, \$23 to \$23.50; Iron Car Axles, \$16.50 to \$17.50; Heavy Melting Steel, \$16 to \$16.50. Net tons: Cast Borings, \$8.50 to \$9; No. 1 Busheling, \$15; No. 1 Railroad Wrought, \$17 to \$18; Iron Car Axles, \$22 to \$23; No. 1 Cast, \$15; Stove Plate, \$11; Iron and Steel Turnings and Drillings, \$11 to \$12.

Cincinnati.

FIFTH AND MAIN STS., February 7, 1906.—(By Telegraph.)

Pig Iron.—The week has been very quiet, without any business to speak of to support established prices. Consumers, as a rule, have covered their requirements for some months to come, and can see no reason for looking into the future, and are content to let matters rest until necessity absolutely demands further purchases, having a conviction that they may be able then to buy at a lower figure than under present conditions. From reports received it looks as though fully 85 per cent. of the consuming trade was covered into the second quarter, and that the market should at this time present a quiet appearance is not to be wondered at. Gray Forge and in fact all the lower grades are rather weak with a fair supply available. What Southern Iron has been sold during the week has been practically for February delivery, consumers evidently being anxious to cover before the 25c. advance in freight rates should become effective. Local foundries are said to be quite busy, with enough Iron on hand to last several months. That consumption is proceeding at a wonderful rate is conceded by all, and is substantiated by the fact that all Iron under contract is being specified for without delay. Freight rates from Hanging Rock district to Cincinnati are \$1.15, and from Birmingham \$2.75. We quote, f.o.b. Cincinnati, as follows:

Southern Coke, No. 1.....	\$17.25
Southern Coke, No. 2.....	16.75
Southern Coke, No. 3.....	16.25
Southern Coke, No. 4.....	15.75
Southern Coke, No. 1 Soft.....	17.25
Southern Coke, No. 2 Soft.....	16.75
Southern Coke, Gray Forge.....	15.25
Southern Coke, Mottled.....	15.00
Ohio Silvery, No. 1 (8 % Silicon).....	21.15
Lake Superior Coke, No. 1.....	19.15
Lake Superior Coke, No. 2.....	18.65
Lake Superior Coke, No. 3.....	18.15

Car Wheel Irons.

Standard Southern Car Wheel.....	\$22.75
Lake Superior Car Wheel.....	21.50

Coke.—Coke is weak, with a full supply available. Contract orders are coming forward with regularity and dispatch, owing largely to the favorable condition of the weather. Few instances are reported where a shortage of equipment has held back shipments, with less labor troubles in sight than is usually the case.

Finished Iron and Steel.—The market for this class of material is all that can be desired. Considerable new work along Structural lines is developing which will take definite shape as soon as Spring is an assured fact. We quote f.o.b. Cincinnati: Iron Bars, in carload lots, 1.65c., with half extras; the same, in smaller lots, 1.90c., with full extras; Steel Bars, in carload lots, 1.63c., with half extras; the same, in small lots, 1.85c., with full extras; Base Angles, 1.73c., in carload lots; Beams and Channels, in carload lots, 1.83c.; Plates, ¼-inch and heavier, 1.73c., in carload lots; in smaller lots, 1.90c.; Sheets, 16-gauge, in carload lots, 2.15c.; in smaller lots, 2.70c.; 14-gauge, in carload lots, 2.05c.; in smaller lots, 2.60c.; Steel Tire, ¾ x 3-16 and heavier, 1.83c., in carload lots.

Old Material.—The demand is said to be only medium. We quote dealers' prices, f.o.b. Cincinnati: No. 1 Railroad Wrought Scrap, \$17 to \$17.50 per net ton; Cast Borings, \$9 to \$10 per net ton; Wrought Iron and Steel Turnings, \$12 to \$12.50 per net ton; No. 1 Cast Scrap, \$14 to \$14.50 per net ton; Iron Rails, \$20 to \$21 per gross ton; Steel Rails, rolling mill lengths, \$15 to \$15.50 per gross ton; Relaying Rails, 56-pound and upward, \$24.50 to \$25 per gross ton; Iron Axles, \$22.50 to \$23 per net ton; Car Wheels, \$17 to \$18 per gross ton; Heavy Melting Scrap, \$15 to \$15.50 per gross ton; Low Phosphorus Scrap, \$18.50 to \$19 per gross ton.

The steam consumption of a 1500-kw. Parsons turbo-generator in the Neepsend station of the Sheffield Corporation, England, was shown to be 22.41 pounds per kilowatt-hour, with an average steam pressure of 190 pounds per square inch, vacuum of 27 inches, superheat of 100 degrees F. and load of 979 kw. These figures are the result of a ten weeks' record, during which the turbine was running about 16 hours per day and six days per week. The maximum loads, carried during the evening, were about the rated capacity of the unit.

Birmingham.

BIRMINGHAM, ALA., February 5, 1906.

Pig Iron.—Very little activity has been noticed in the Iron market this week and the general conditions prevailing last week continue. Only a few orders were booked and these principally for off grades. The producers are very insistent in their statements that no decline has taken place, explaining that orders accepted at less than current prices were for off grades, of which some of the furnaces, owing to bad runs, were accumulating stocks and that slight concessions were made to move this Iron. They admit, however, that some speculative Iron is to be had on a \$14 No. 2 Foundry basis, but state there is not a sufficient quantity of it to disturb the market greatly. The largest producers claim that they have only a very small unsold tonnage and are firmly maintaining a basis of \$14.50 for No. 2 for delivery during the first half of the year, and do not care to quote beyond that time. The furnace operators are watching with much interest the outcome of the operators and United Mine Workers' convention at Indianapolis last week. Inasmuch as it affects every part of the United States except Alabama and Tennessee, these States will be called upon to furnish a much larger amount of Iron than heretofore should the suspension be of any very great duration. The contract with the United Mine Workers in this State does not expire until June 30, and as the furnace companies, with but one exception, are working their mines on the open shop plan a sympathetic strike would not curtail production here to any appreciable extent. Within the last day or so some large inquiries for Iron for future delivery at present prices have been turned down pending further developments. Two additional furnaces will go in blast this week. The Central Iron & Coal Company's furnace at Tuscaloosa, blown out last December, has been relined and thoroughly overhauled and will have the torch applied today, and one stack of the Alice Furnace, belonging to the Tennessee Coal, Iron & Railroad Company, will be blown in the latter part of the week. These two furnaces will increase the daily production of the district about 400 tons.

Old Material.—The market has about settled down and dealers report a satisfactory week's business. Shipments have not been very heavy but a better understanding seems to prevail, present prices being acceptable to both the dealer and buyer. Quotations are approximately as follows per gross ton, f.o.b. cars here:

Old Iron Rails.....	\$20.50 to \$21.00
No. 1 Railroad Wrought.....	18.00 to 18.50
No. 2 Railroad Wrought.....	17.00 to 17.50
No. 1 Country Wrought.....	16.00 to 16.50
No. 2 Country Wrought.....	15.00 to 15.50
Wrought Pipe and Flues.....	13.00 to 13.50
Mixed Steel.....	12.00 to 12.50
No. 1 Machinery Cast.....	11.00 to 11.50
Stove Plates and Light Cast.....	10.00 to 10.50

Cast Iron Pipe.—On account of the extremely light winter the manufacturers have not experienced the usual dull season at this time of the year, as Pipe laying has continued right along. Current orders are taking more than their output and they have had no opportunity to stock up for spring trade. More difficulty may therefore be expected in securing prompt delivery in the future than heretofore. Following are about the prevailing prices on Water Pipe per gross ton:

4 to 6 inch.....	\$27.00
8 to 10 inch.....	26.00
12 to 20 inch.....	25.00
24 to 48 inch.....	24.00
Gas Pipe, \$1 per ton extra.	

The Nail mill of the Southern Steel Company at Ensley, which was destroyed by fire this week, will, it is reported, be rebuilt at once on a more extensive scale, using the latest improved machinery.

It is announced that a cement plant, to cost \$1,500,000 and to have a daily capacity of 1800 barrels of Portland cement, will be put under construction at once at Leeds, about 15 miles from Birmingham, by the National Portland Cement Company, formed by a combination of the Carolina Cement Company, Charleston, S. C., and the Old Dominion Cement Company of Virginia and local capitalists.

New York.

NEW YORK, February 7, 1906.

Pig Iron.—There is some good business pending in this district for Foundry Iron. An encouraging fact is that some good orders for Foundry Iron, for delivery during the third quarter, have been recently placed in the Philadelphia district, close to present prices. Some furnaces, which are about to blow in, are offering a shade under the market. We continue to quote: Northern Iron, No. 1 Foundry, \$19 to \$19.25; No. 2 Foundry, \$18.50 to \$18.75, and No. 2 Plain, \$18.25 to \$18.50. Southern Iron is selling at \$18.50 to \$19 for No. 1 Foundry, and \$18 to \$18.50 for No. 2 Foundry.

Steel Rails.—An order for 40,000 tons for the Kansas City Southern Railroad was the most important business of the week. Also of interest is the first definite information

concerning the total placed by the Vanderbilt lines, which is 150,000 tons, instead of 100,000 to 110,000 tons, as estimated some time ago. The total of Rails placed for 1906 delivery is now close to 2,500,000 tons, apart from what was carried over from 1905. The buying for trolley lines has not been so active since 1902, conditions in the past year having made it possible to finance projects that first came forward in 1903 and 1904. It is believed that the requirements for electric roads alone will be between 500,000 and 600,000 tons in 1906. We continue to quote Standard Sections at \$28 at mill.

Structural Material.—Though January was not considered a particularly good month for the company, the American Bridge Company finds that its contracts closed in the month amounted to 40,000 tons, or practically up to the monthly average in 1905. In the past week the principal New York business placed was for the Spring street branch of the New York Telephone Company, a six-story building, 100 x 100 feet, calling for 1500 tons, the columns being unusually heavy, with a view to additional stories later. At Los Angeles, Cal., a building requiring 1000 to 1100 tons is pending, as is the Head office building at San Francisco—1100 tons. In view of the amount of work in bridges and buildings that is now up and expected to be placed in the next few months, it is estimated that all the fabricating companies in the country will soon have a year's work ahead, assuming that the tonnage is equally distributed. In New York the contract for the terminal stations of the New York & New Jersey Tunnel under the Hudson River, generally known as the McAdoo Tunnel, is the most important pending, the tonnage being about 30,000. The Steel work for the Manhattan Bridge over the East River is to be relet and Bridge Commissioner Stevenson announces that bids will be called for in a few days. The award to the Pennsylvania Steel Company having been annulled by the courts, it is believed the litigation over that contract will not be prosecuted farther. We continue to quote as follows on mill shipments of Structural Steel, tidewater delivery: Beams, Channels, Angles and Zees, 1.84½c.; Tees, 1.89½c.; Bulb Angles and Deck Beams, 1.99½c. Beams, 18 to 24 inc., 0.10c. extra; Angles over 6 inches, 0.10c. extra. Out of stock Beams and Channels are sold at 2.50c. for domestic Steel, German shapes bringing somewhat lower prices.

Bars.—The situation continues quiet, the market showing no transactions of special moment. Quotations are continued at 1.84½c. to 1.89½c., tidewater, for Bar Iron, and 1.64½c. to 1.84½c., tidewater, for Steel Bars, according to delivery desired.

Plates.—No new developments have occurred in this branch of trade. The demand continues rather light, orders being entered for small lots only. Specifications on contracts are keeping the mills very busy, more than covering daily shipments. Quotations are continued, as follows, at tidewater: Sheared Tank Plates, 1.74½c. to 1.84½c.; Flange Plates, 1.84½c. to 1.94½c.; Marine Plates, 2.14½c. to 2.24½c.; Fire Box Plates, 2.24½c. to 2.60c., according to specifications.

Cast Iron Pipe.—The largest transaction of the week which has come to light is the letting of 1000 tons of mixed sizes at Worcester, Mass., on Monday, for which the Warren Foundry & Machine Company was the successful bidder. No business of importance is in sight at present. Carload lots are held at \$29.75 per net ton for 6-inch at tidewater.

Old Material.—Consumers of Steel Scrap are not making purchases for early delivery, as their wants are well supplied for some little time. Some important interests, however are making purchases of Steel Scrap for future delivery and the prices realized on such transactions are very close to our quotations. Excellent inquiries are in the market for Cast Scrap and negotiations are now proceeding for quite a number of round lots. As the supply is by no means large the market for Cast Scrap is very strong. The rolling mills are doing little in the market at present, as they appear to be well supplied with stock. While prices on Wrought Scrap and rolling mill material generally are soft, it is asserted that our quotations could hardly be shaded more than 50c. per ton. In the absence of transactions last week's figures are continued. Approximate prices per gross ton, New York or vicinity, are as follows:

Old Iron Rails.....	\$22.00 to \$23.00
Relaying Rails.....	25.00 to 26.00
Old Steel Rails, rerolling lengths.....	16.50 to 17.00
Old Steel Rails, short pieces.....	16.00 to 16.50
Heavy Melting Steel Scrap.....	16.00 to 16.50
Standard Hammered Iron Car Axles.....	26.00 to 27.00
Old Steel Car Axles.....	21.00 to 22.00
No. 1 Railroad Wrought.....	21.50 to 22.00
Iron Track Scrap.....	18.50 to 19.25
No. 1 Yard Wrought, long.....	19.50 to 20.50
No. 1 Yard Wrought, short.....	17.50 to 18.50
Wrought Pipe.....	14.75 to 15.25
Light Iron.....	11.50 to 12.00
Cast Borings.....	9.25 to 9.50
Wrought Turnings.....	13.00 to 13.50
Old Car Wheels.....	18.50 to 19.00
No. 1 Machinery Cast.....	15.00 to 15.50
Stove Plate.....	12.50 to 13.00
Malleable Cast.....	16.00 to 16.50

Metal Market.

NEW YORK, February 7, 1906.

Pig Tin.—The market is lower to-day, due to a sharp decline in London. The highest price during the week was reached February 2, when Tin was sold at 36.75c. On the 5th the price declined to 36.50c., and on the 6th 36.30c. was reached. This was partially because of large arrivals from Europe. To-day's price is again lower at 36.20c. The London market is weak, and closes to-day at £164 10s. for spot and £163 for futures, a decline of £2 15s. for futures in two days. The Tin statistics, as compiled by C. Mayer, secretary of the New York Metal Exchange, show that while the total visible supply on January 31 was 1359 tons below that of a year ago, it was nearly 1000 tons above the visible supply of December 31, 1905. The total supply for Europe and the United States on January 31, 1906, was 14,286 tons. The stocks on hand in the United States January 31 were 1251 tons, against 851 tons on December 31. The shipments from the Straits during January, amounting to 5970 tons, were unprecedented. The arrivals so far this month aggregate 1608 tons, and there are afloat for American ports 3390 tons. It is reported that shipments from the Straits during February will be nearly as large as during January.

Copper.—In the absence of any amount of business, quotations are purely nominal and again lower. For deliveries during March we quote Lake Copper at 17½c. to 18c.; Electrolytic, 17½c. to 17¾c.; Casting Grades, 17½c. to 17¾c. Strictly spot stocks would command a premium above these prices, varying according to the time of delivery and the amount of metal taken. On a firm bid for a round lot of Copper concessions from these prices could probably be obtained in some quarters, if deliveries were to extend over a considerable period. The London market is again slightly lower, closing to-day at £77 for spot and £75 for futures. The exports so far this month amount to 3132 tons. It is believed that the larger consumers are well supplied with metal up to the end of March, and that what little metal there is being sold at the present time is for smaller consumers, or to fill in where purchases have not been in sufficient quantities.

Lead.—There was perhaps a trifle more activity to the Lead market during the week, and the price continues unchanged from last week at 6.75c., New York. In St. Louis the market is quiet, and sales have been reported at 5.52½c. The London market is again lower at £16 7s. 6d.

Spelter.—Business is very quiet, and prices are a trifle easier. We quote for spot, February and March New York City deliveries, 6.10c. In the West the market is easy at 5.95c. The prices for Ore are unchanged from last week. According to reports compiled by Henry R. Merton & Co., London, the world's production of Spelter in 1905 was 647,585 gross tons.

Antimony.—There is practically no change. Cookson's is held at 14.50c. to 15c.; Hallett's at 14.25c. to 15c.; other brands at 13.75c. to 14.50c.

Nickel.—Large lots are held at 40c. per pound; smaller quantities at 50c. to 60c. per pound.

Tin Plate.—Business at the mills is fairly active and specifications on old contracts continue to come in freely. New business is very light. Prices are unchanged on the basis of \$3.50 f.o.b. Pittsburgh, or \$3.69 f.o.b. New York, for 100-pound IC Coke Plates. In Swansea, Welsh Plates are unchanged at 12s. 9d.

Old Metals.—The decline in the price of Ingot Copper has made it necessary for dealers in Old Metals to revise their quotations on Copper and Brass Scrap. We revise quotations, as follows:

	Cents.
Copper, Heavy Cut and Crucible.....	17.25 to 17.50
Copper, Heavy and Wire.....	16.75 to 17.25
Copper, Light and Bottoms.....	15.25 to 15.75
Brass, Heavy.....	12.00 to 12.25
Brass, Light.....	10.00 to 10.25
Heavy Machinery Composition.....	15.25 to 15.50
Clean Brass Turnings.....	10.25 to 10.50
Composition Turnings.....	13.25 to 13.50
Lead, Heavy.....	5.15 to 5.25
Tea Lead.....	5.00 to 5.15
Zinc Scrap.....	5.00 to 5.10

Iron and Industrial Stocks.

NEW YORK, February 7, 1906.

The stock market has been under pressure for a considerable part of the past week. The railroad stocks, however, were most affected. Some of the industrials moved independently of the railroad stocks, reaching quite high prices. Conspicuous among these were the following: Tennessee Coal sold up to 165, Sloss-Sheffield common 93¾, United States Steel preferred 113, United States Steel common 46¼, Republic preferred 108, Republic common 36¾ and Locomotive common 75¾, all on Friday. The lowest point touched by all these stocks in the reaction which followed was on Monday, when a recovery set in, but in very few cases were previous high prices reached. Last transactions up to 1.30 p. m. to-day are reported as follows: Can common 11½, preferred 71; Car & Foundry common 45, preferred

103¾; Locomotive common 76½, preferred 117½; Steel Foundries common 13½, preferred 49½; Colorado Fuel 74; Pressed Steel common 62, preferred 103¾; Railway Spring common 61; Republic common 34¾, preferred 108¼; Sloss-Sheffield common 88½; Tennessee Coal 157½; United States Cast Iron Pipe common 50½, preferred 96½; United States Steel common 45; preferred (ex-dividend 1¾ per cent.) 110¾.

The New Jersey Steel Company, manufacturer of steel castings, Rahway, N. J., is offering through the American Finance & Securities Company, 5 Nassau street, New York, at par and interest, \$150,000 first mortgage 6 per cent. 20-year gold bonds, interest dates November 1 and May 1, accompanied by 50 per cent. of common stock. The total bond issue is \$250,000. The company's capitalization is \$150,000 7 per cent. cumulative preferred stock and \$850,000 common stock. Its statement February 1 shows assets of \$511,512.41 and its only liability the bond issue. The company has recently been reorganized and active operations were resumed January 22. The directors are William Howard, president Rahway National Bank; John McE. Ames, chief engineer American Car & Foundry Company; Edward B. Kurtz, president American Finance & Securities Company; A. W. McArthur, formerly manager of the General Electric Company's Lynn steel plant; F. W. Hughes, formerly secretary Buckeye Buggy Company, Columbus, Ohio; T. W. Synnott, Philadelphia, capitalist and president First National Bank, Glassboro, N. J.; James D. Hunter, vice-president James Hunter Machine Company, North Adams, Mass.

The annual statement of the Chicago Pneumatic Tool Company for the year ended December 31 makes that the best year's business in the history of the company. The net profits for the year amounted to \$852,612, as compared with \$470,579 in 1904. Earnings available for dividends were \$559,685. Of this amount \$244,551 was paid in dividends and the balance was carried to surplus, making that item \$536,292.

Tennessee Coal, Iron & Railroad Company.—Stockholders of this company met at Tracy City, Tenn., January 31, and adopted a resolution to increase the capital stock to \$30,000,000 by the issuance of new common stock and to authorize the disposition of the new stock. The action of the Board of Directors in increasing the stock was ratified. The directors of the company met in New York February 2 and elected George A. Kessler a member of the board. S. L. Schoonmaker and F. S. Witherbee resigned from the directorate, and no action was taken regarding the filling of the vacancies, of which there are now three. It was decided to issue a circular to stockholders offering them the right to subscribe at par to the extent of 15 per cent. of their holdings for \$3,417,204 of new stock out of a total authorized issue of \$6,751,700 new stock. The balance will be issued as the company requires. The payment on the subscriptions will be 25 per cent. at the time of subscription, 25 per cent. July 16, 25 per cent. October 16 and the final 25 per cent. January 16, 1907. The subscription books will be opened probably some time this month. The expenditure of several millions on the property of the company is expected to greatly enhance its earning capacity. At present it is producing about 50,000 tons of pig iron a month and is turning nearly 50 per cent. of it into finished products. It is estimated that the new capital, together with the accumulating surplus earnings, will enable the company to increase its pig iron production in time to 1,000,000 tons per annum, and it is contemplated to turn all of this output into finished forms.

Dividends.—Republic Iron & Steel Company has declared the regular quarterly dividend of 1¼ per cent. on the preferred stock and a dividend of 2 per cent. in part liquidation of the amount which accumulated during the period when no dividends were paid on the preferred stock. Both dividends are payable April 2.

Trade Publications.

Steam Engines.—Bates Machine Company, Joliet, Ill. Folding mailing card. Illustrates the Bates automatic high speed vertical engine and in a few words discloses its important points of excellence.

Refrigerating Machines.—De La Vergne Machine Company, foot of East 138th street, New York City. Mailing card. Contains a three-page table of properties of saturated ammonia gas, half-tone engraving of one of the company's standard horizontal refrigerating machines and a graphical comparison of the product in gross tonnage of 43 of the largest builders of this class of machinery.

Steam Hoisting Engines.—C. W. Hunt Company, West New Brighton, Staten Island, N. Y. Catalogue No. 058. Covers a number of hoisting engines that are unusually massive in construction and specially designed for heavy duty in continuous service. In connection with the description of the construction of the engines there are a number of interesting illustrations showing processes in the machining of the different parts and broken sections of the parts to show the form. Many additional illustrations show typical hoisting engines and notable installations.

The Machinery Trade.

NEW YORK, February 7, 1906.

No important developments in the way of large propositions were reported the past week and beyond a slight easing up in deliveries no change in the machine tool trade is noted. Some branches of machinery have been affected, however, to some extent by the trouble that has arisen between the builders of heavy power equipment, but it is believed that only a few of the merchants will be drawn into the controversy. On large power projects there has been so much cutting of prices that very little, if any, profit has been gained by the successful bidder on many of the large contracts recently closed. Several reports are in circulation concerning combinations or agreements, but only that of the street car builders shows signs of an early consummation.

The price cutting war which began some time ago in electric motors has extended to the heavy power generating equipment. Notwithstanding the fact that business conditions in those lines are especially good and the demand, for heavy engines particularly, is larger than it has been in many months, some disastrous price cutting is now going on in the trade, and the big concerns which are the most active participants in the war are fighting for all of the big contracts that come up in a manner that leaves little room for profits. As a matter of fact the profits are not being considered in some cases and it seems to be the attitude of some of the contestants to secure contracts even at a loss to themselves. A large Western concern has made a number of big cuts of late, and in cases where its competitors have bid on electric sets, while another company has bid on the engines, efforts have been made by the Western company to get the entire contract by underselling the joint price submitted by the parties offering the electric sets and the engine manufacturers.

An instance is recorded where prices on a big power job were put down more than \$7000 as a result of the rate war. Smaller companies making heavy engines have been obliged to stand back in the fight, contenting themselves with contracts where they can get a fair margin of profit, although even they have been obliged in some cases to accept contracts at an extremely low rate in order to keep their patronage. While the rate cutting hurts the small manufacturers to a degree, it is said in the trade that at least one of the companies that has been carving down profits has been taking contracts where, on the face of it, there is nothing to show that it will come out whole, as far as getting any revenue out of the job is concerned. Alliances which have been made by some engine makers with electric companies have resulted in their having been drawn into the fight to an extent, and the war on that account is more or less general, although the big interests are the parties most directly concerned. With business so good it is regrettable that this condition of affairs exists, and the feeling in the matter on all sides is that there would be plenty of profit for all concerned if the price cutting could be stopped.

Every evidence points to the successful outcome of the plan for the consolidation of several of the more important street railway car builders, and we understand that an important announcement concerning the merger will be made within the next few days. The merger of the car builders has been on the tapis for some time and the first intimation of its successful culmination was brought to light a few days ago when W. T. Van Brunt, one of the promoters of the scheme, took up the option on the Wason Car Company, Springfield, Mass., one of the few companies upon which the promoters held an option. As this plant is one of the more important ones that are to be taken into the combine, there is very little doubt but that the combination is to go through, although as yet nothing official has been given out.

The efforts of the St. Louis Machine Company to establish a uniform price-list for pocket loose leaf price books has resulted in considerable interest in the trade over the question of arranging the lists. *The Iron Age* printed recently a series of questions sent out to the trade by the company in order to establish uniform methods for listing prices in the 4 x 7 1/4 inch pocket price books which are generally used in the trade. In answer to the question, "Do you prefer to have manufacturers' literature contain list prices?" 73 per cent. of the answers were Yes, while 24 per cent. were No. Of those who replied in the affirmative to the query 56 per cent. favored a low list and small discount, while 31 per cent. favored a high list and large discount. In answer to the question, "Do you prefer to have the same list printed in the price sheets that is printed in the circular or catalogue?" 66 per cent. answered Yes, while 18 per cent. answered No. Answering the question, "Do you prefer to have the prices on price sheet net cost, f.o.b. cars at point of manufacture?" 21 per cent. answered Yes, while 69 per cent. answered No, while in answer to the query, "Do you prefer to have the prices on the price sheet, f.o.b. cars at point of manufacture?" 36 gave affirmative answers, while 48 were in the negative. It will be seen that the answers did not show 100 per cent. to any

of the questions. This is explained by the fact that a number of parties omitted to answer to some questions that they were probably undecided about. The St. Louis Machine Company tabulated the strictly machinery dealers and the supply and machinery dealers separately to ascertain the proportion of answers, and it was found that the strictly machinery dealers furnished 23 per cent., while a considerable majority of machinery dealers were in favor of having manufacturers' literature contain list prices. All but one of the machinery and supply dealers favored it. On that account the company got out its sheet containing the list prices subject to a large discount and left a blank space for those who wish to furnish their salesmen with a net cost.

Association Notes.

The first annual meeting of the National Supply and Machinery Dealers' Association will be held at the Hotel Chamberlain, Fortress Monroe, Va., on February 14, 15 and 16. It is expected that a large proportion of the members will attend, and among other topics there will come up for discussion the question of cash discounts on retail prices and their advantage to the manufacturer, local associations and their benefits; the sizes and arrangements for catalogues and price books and kindred subjects. So far as it is announced these are the subjects scheduled for discussion, but it is thought that many other topics of general interest to the trade will come up at the meeting.

The officers of the association are making heroic efforts to find a worthy successor to J. H. Drury, who has been secretary-treasurer of the association since its organization. Mr. Drury is peculiarly adapted to fill the office, especially during the period when the work is chiefly to build up a strong and representative membership, in view of his wide acquaintance with the machinery and supply trade of the country and the personal friendship of the leading dealers of the country which he enjoys. Since taking up the work, however, he has found that his other business interests have grown to such an extent as to necessitate the devotion of his entire time to them. It is well known in the trade that he intends handing in his resignation at the Old Point convention and that it is the desire of the officers to select a successor who may be appointed at once, so that the work of the association may go on uninterrupted.

Associations in different branches of manufacture have been found to be of considerable advantage in the way of fostering trade, reforming business abuses and promoting harmony among the members. Realizing the benefits to be derived from an association in its branch of business manufacturers of electric vehicles have formed the Association of Electric Vehicle Manufacturers, which will maintain its principal office in New York. Connected with this new association as directors are Robert M. Lloyd of the Vehicle Equipment Company, Brooklyn, N. Y.; George Pope of the Pope Mfg. Company, Hartford, Conn.; M. L. Gross and J. W. McCrea of Cleveland, Ohio; T. W. Goodrich of South Bend, Ind., and James MacNaughton of Buffalo, N. Y.

Important Machinery Requirements.

The Iroquois Machine Company, 150 Nassau street, New York, factory, Providence, R. I., has lately secured such large contracts for some of the machinery it builds as to necessitate its quadrupling its present manufacturing facilities, which it is now doing, adding about 40,000 square feet of floor surface. The company is now in the market for a large amount of additional machine tool equipment incident to this increase of floor space.

The Erie Railroad has plans under way for the erection of an extension to the erecting shop now in course of construction at Hornellsville, N. Y., besides a large new machine shop. The power plant and erecting and boiler shops in course of construction at the plant are nearly completed and will shortly be put into commission. The machinery is being installed at present and the contract was given last week to Westinghouse, Church, Kerr & Co. for furnishing equipment for lighting the entire plant at that point, which, with the proposed machine shop and extension to the erecting shop, will comprise 11 buildings. The new machine shop will be 185 x 554 feet and the extension to the erecting shop will be about 76 x 382 feet. The erecting shop which is being completed there at present is 76 x 172 feet. No financial provision has been made as yet for the construction of the new shop, but it is expected that an appropriation will be made shortly and the work on the additions will be begun by spring at least. The Erie Railroad is looking into the question of electrifying some of its suburban lines and the directors of the company have authorized Vice-President Graham to organize an electrical commission, for the purpose of studying the question in detail, with a view to fixing upon a system which will be tried on one of the suburban lines as an experiment. Mr. Graham is chairman of the commission and the other members are E. A. Williams, general mechanical superintendent; A. J. Stone, assistant general manager; C. H. Morrison, acting electric engineer, and B. J. Arnold and L. B. Stillwell, electrical experts. It is the idea of the commission to look into the details of the different electric traction systems and a branch of the company's line will be selected for experimental purposes. The company

has about 250 miles of suburban track, which it intends to include in its electric zone, and it is promised that as soon as the commission decides on a system work will be begun and within 18 months, it is thought, an experimental line will be in operation, at least.

The Pennsylvania Railroad Company reports a week of inactivity in the tool and machinery line with little prospect of any immediate purchases or inquiries until the authorization of the construction and equipment programmes, which will probably come before the Board of Directors during the next month. That the demands upon the machinery trade will be heavy is indicated by the large programmes which each division has prepared, and in most cases authority will be asked for improvements beyond the schedules of the immediately preceding years.

The Otis Elevator Company, 17 Battery place, New York, has plans completed for the first of its several shops that are to be erected on the 35 acres of land recently purchased at Buffalo. The plans so far prepared include two shops, each of which will be 100 x 350 feet and one story in height. The buildings will be of standard mill construction, and they will be utilized for the manufacture of tracks and guides for elevator shafts. The Buffalo plant will be limited to this output until additional buildings can be constructed. The property purchased is located on the New York Central Belt Line and it is the intention of the company to establish a large plant there in the future, and plans are under way for additional structures.

The Berwind-White Coal Mine Company, 1 Broadway, is preparing for the erection of its car building and repair shops at Hollidaysburg, Pa. The company has about 50 acres of ground adjacent to the Pennsylvania Railroad and the plant will include, besides an erecting shop, a large machine shop and an extensive power plant.

Another large plant is to be erected for the manufacture of copper and brass tubing, sheets, rods, &c. The plant is to be erected by the Atlan Brass & Copper Company, which has been incorporated with a capital stock of \$750,000, and at the head of which is James Hay, president of the Ruud Mfg. Company, Pittsburgh, Pa., maker of the Ruud water heaters. A free site has been secured at Trafford City, Pa., near the large foundries of the Westinghouse Electric & Mfg. Company and the Westinghouse Machine Company, upon which the plant will be built. A good part of the output will be used in the manufacture of the Ruud heaters, but goods will also be made for the open market. The enterprise is in embryo as yet, but it is expected that plans will mature very shortly and the work gotten under way.

A plot of ground about 80 x 155 feet has been purchased by the Dixie Mfg. Company, manufacturer of exhaust fans, exhaust and blow piping, dust collectors, automatic furnace feeders, &c., Baltimore, Md., on which it intends to erect a two-story building about 60 x 155 feet, the plans for which have not yet been definitely decided upon. The company will operate the new building by electricity and will heat it with steam. The increased facilities have been made necessary by a continuous increase in the company's business.

The Montford Machine Casting Company, Baltimore, Md., has closed a contract for the erection of new additions to its plant, the two main buildings of which will cover an area 120 x 140 feet. There will be a new foundry building, 60 x 140 feet, in which will be installed a new cupola of 10 to 12 tons an hour capacity, which will give the foundry a capacity of 25 tons an hour. Separate buildings will be erected for the blowers, elevators and tumbling barrels, and a building 25 feet square will be erected for shipping purposes. An industrial railway is to be constructed, so that material can be conveyed from one part of the plant to another conveniently. The office will be moved to the second story.

The De Lamar Copper Refining Works, at Carteret, N. J., has plans for a large electrolytic copper refining plant to be erected at East Chicago, Ind., and equipment for the plant is now being purchased. The new plant will have a capacity of about 3000 tons a month, and it is proposed to build it as soon as possible.

The electrolytic copper refinery of the Raritan Copper Works, Perth Amboy, N. J., is to be doubled in size, and machinery is now being purchased for the improvement by George K. Fischer, consulting engineer, 17 Battery place, New York. The company will install about 3200 horsepower, and work on the addition will be carried forward as rapidly as possible. Mr. Fischer is receiving bids on various equipment. Some contracts have been closed.

The Buffalo Subway Railroad Company, with a capital stock of \$1,000,000 has filed a certificate of incorporation with the Secretary of State at Albany, N. Y. The Subway company's proposed line is described as an underground electric road, extending from the center of the city to a point in East Buffalo adjacent to the property of the Terminal railway of Buffalo and on the line of the proposed Buffalo Frontier Terminal Railway, a distance of about 5 miles. The cost of the line is estimated at \$7,000,000.

Business Changes.

The well known firm of Pedrick & Ayer, formerly of Philadelphia, now located at Plainfield, N. J., has been purchased and its plant will hereafter be operated by the Railway Appliances Company, Chicago, Ill.

J. A. Prescott has been appointed manager of the St. Louis office of the Blaisdell Machinery Company, Bradford, Pa., manufacturer of air compressors, and of the Jeanesville Iron Works Company, Hazelton, Pa., manufacturer of pumping machinery. This office will have charge of the entire southern and southwestern territory. Mr. Prescott recently resigned from the Rand Drill Company as manager of the St. Louis office, after having been in its service about 15 years.

New England Machinery Market.

WORCESTER, MASS., February 6, 1906.

Some of the planer manufacturers have announced an advance in prices of fixtures for motor drives and for variable speed mechanisms. This is a result of the comparison afforded by the tabulated statement of prices of the various members of the planer section of the National Machine Tool Builders' Association, which was recently sent out by President E. M. Woodward. It was demonstrated that the manufacturers were a good ways apart on prices for these special features and the natural action of those who were low in their lists was to advance, to be in conformity with their competitors and to thus take better advantage of the present condition of the machinery market. The increase in prices varies, each manufacturer acting independently in the matter. Some have made no change, because they were high enough. Others have made radical advances. The information contained in the statement affords an excellent illustration of the advantages resulting from the National Association.

As for other special planer fixtures, side heads and heads on cross rail, the tabulated statement demonstrated that the planer builders are not far apart on prices and consequently no change in lists may be expected.

The semiannual meeting of the National Machine Tool Builders' Association will be held at Atlantic City, beginning either April 9 or 16. President Woodward is consulting members as to which date will be convenient to the greatest number, and the matter of hotel accommodations, especially of headquarters, will enter into the decision as to date. President Woodward has asked Secretary Montanus to take up the matter with the Hotel Chalfonte, with a view to making that hostelry the headquarters. A number of the New England members will be accompanied by their wives on the trip, which will add to the social side of the occasion. There will be a large attendance from this part of the country.

A number of the New England machine tool builders have been invited to attend the annual meeting of the National Supply and Machinery Dealers' Association, to be held at Fortress Monroe, February 14, 15 and 16, but it is not known that there will be representation of the manufacturers from this section. The National Machine Tool Builders' Association will not be represented by any formally appointed delegates. President E. M. Woodward is unable to be present because of pressure of business of the Woodward & Powell Planer Company, of which he is the president and treasurer, and other prominent manufacturers find themselves in the same situation.

Boston machinery circles are pervaded with rumors of large machine tool requirements from prospective buyers, the names of whom are not divulged by those who have been taken into the secret. There is "something doing," but it is not believed that lists are as yet in more than a tentative condition. One conjecture is that a large company is forming for the manufacture of shoe machinery on a large scale, in competition with the United Shoe Machinery Company. Rumors to this effect have been rife for several weeks, and on top of them comes the announcement of the organization under Maine laws of a new company, the International Shoe Machinery Company, with an authorized capital stock of \$1,000,000. The persons named as officers are acting merely as dummies and decline to state the names of the parties actually interested. The mere fact of the existence of this company may mean a good deal or nothing at all. Maine corporations are usually misleading in the capitalization named in the charter, high figures being the rule rather than the exception. On the other hand, there may be a good deal in the general rumor, though as yet few are in a position to more than guess at it.

If there is a coal strike New England will not be caught unawares, as it has been in the past. The manufacturers are pretty well stocked up and most of the dealers have prepared for a shortage of supply at the mines by filling their yards to full capacity. This is true of both hard and soft coals. Manufacturers, of course, are chiefly interested in the bituminous situation, but many of them, especially in the cities, are now using the finer sizes of anthracite.

Boston business men are dissatisfied with freight facilities.

between their city and points in Connecticut, New York and central Pennsylvania, and a joint meeting has been held by the transportation committees of the Boston Merchants' Association, the Associated Board of Trade, the State Board of Trade and the New England Shoe and Leather Association. The matter was threshed out and plans toward seeking a remedy were made.

The expansion of the brass industry of the Naugatuck Valley, Conn., in the immediate future is indicated by recommendations of the boards of directors of the American Brass Company and of the Scovill Mfg. Company, Waterbury. A meeting of the stockholders of the American Brass Company has been called for February 27 at Waterbury, to act on the matter of increasing the capital stock of the corporation from \$10,000,000 to \$12,500,000. The directors of the Scovill Mfg. Company have recommended to the stockholders the increase of capital stock from \$3,250,000 to \$4,062,500, by which arrangement stockholders will be permitted to subscribe for the new stock at par to the amount of 25 per cent. of their present holdings. It is understood that the new capital is needed in both instances for the expansion of the business.

The Hersey Mfg. Company, South Boston, Mass., manufacturer of water meters and sugar machinery, is to erect a new machine shop, to be 43 x 102 feet and five stories, to provide needed additional manufacturing space.

The American Cableway Company, Fall River, Mass., has been organized in Massachusetts to manufacture hoisting and conveying machinery. The authorized capital stock is \$125,000. The works will be located in Fall River. The officers are: President, J. T. Lyons; treasurer and clerk, T. F. Monaghan, both of Fall River.

The Pitkin Supply Company has opened an office and warehouse at 259 Atlantic avenue, Boston, where, as sole New England selling agent, it will carry a large and complete stock of stone and metal working pneumatic tools manufactured by the Thomas H. Dallett Company, Philadelphia, and of wire rope for all purposes, manufactured by the Whyte-Moon Company, New York. The Pitkin Company will also carry a complete line of quarry, contractors', mining and marine supplies and will act as sole New England agent for the Wedge electric compressed air heater, used for heating compressed air for stone and metal working pneumatic tools.

The Boston Elevated Railway Company, Boston, has placed orders for 248 car equipments with the General Electric Company.

The Charlestown Navy Yard has been seriously crippled by the decrease in monthly allotment of funds, which has just gone into effect by order of the Navy Department.

It is understood that the Washington Mills, Lowell, Mass., will be in the market for machine tools for a new shop which it contemplates building.

Providence industries are hampered by lack of building space. A proposed industrial building, a four-story structure, 50 x 150 feet, has been rented before contracts for its erection have been let, manufacturing jewelers being the prospective tenants, and it is said that several such buildings would be tenanted almost immediately, and without seriously interfering with the rents of older buildings.

The Briggs Iron Works, Albany street, Springfield, Mass., is a new industry which has been in operation about a month, manufacturing high grade gray iron castings. The company occupies a building 60 x 140 feet, and the plant is served by a spur track from the New York, New Haven & Hartford Railroad, bringing raw materials to the door of the cupola. G. H. T. Babbitt, the president, who has the office management, has been for 18 years with the Chicopee Mfg. Company as purchasing agent and assistant superintendent. George W. Briggs, treasurer and foundry manager, has had 25 years' practical experience as a molder and as superintendent of various foundries.

The Warren Steam Pump Company, Warren, Mass., is bringing out a new marine type steam pump.

The American Optical Company, Southbridge, Mass., is to erect a new building to be devoted to its gold department. It will contain the assaying department, heavy rolls and other machinery for handling this class of work. Details of the building are not yet completed.

The William A. Harris Steam Engine Company, Providence, R. I., states that it hardly hopes to develop its new property at Central Falls this season.

The Pittsfield Street Railway Company, Pittsfield, Mass., is to erect a new power station in that town. The equipment is almost decided upon, the company states.

The interesting report comes from Bristol, R. I., that the Herreshoffs, famous builders of yachts, are contemplating going into the manufacture of high speed automobiles. It is understood that space in the Herreshoff shops has been apportioned for this branch of the business, probably for experimental purposes.

During the month of January the Pennsylvania Railroad Company had the largest freight car movement in its history and broke the record made in December, which had been ahead of anything previously achieved.

Philadelphia Machinery Market.

PHILADELPHIA, PA., February 6, 1906.

Orders continue to be received by both manufacturers and merchants in fairly good quantity, although the same general characteristics which have dominated the market during the past month still prevail. Most of the orders placed are for small quantities. Here and there specifications for a tool room equipment, or for a small lot of tools for extension purposes come out, but even these have been scarce. The railroads have not come into the market to any extent. Inquiries on the whole have been comparatively good and are said to lead up to business promptly, as it is becoming a well established fact that if deliveries are wanted promptly—as the term is now largely understood—it is quite likely that several months will elapse before the tool in question may be shipped; and therefore delays in placing business mean only more extended time for delivery. The demand for tools of the heavier types appears to be increasing and a large part of the business placed during the past week has been for tools of that class. Deliveries are practically unchanged. In cases it is possible to obtain some of the medium sized tools a shade more promptly, but the general line of tools are as hard to get as ever. In instances manufacturers have withdrawn definite dates of deliveries on some sizes of their tools, while on others from four to six months are required for shipments. Heavy and large special machine tools are generally the most uncertain as to time of delivery.

The foreign demand remains unchanged. There has been no aggressive demand for any particular class of tools, and the market, on the whole, is rather inactive.

Engines and boilers have been in somewhat better demand. Inquiries for the larger sizes of engines have been coming in more freely, although business does not develop very satisfactorily. Turbine engines are being installed in a number of instances, particularly in electric railroad power plants. The market for the smaller types of engines and boilers is not as active as might be desired. Some buying has been done, but the business transacted has not aggregated a very large total.

The foundry trade continues very active. The demand for castings of all classes has been heavy, and orders have been booked for good tonnages. Steel foundries have taken on a good amount of business, and have orders enough to keep them busy for a long time. Gray iron foundries are gradually getting into better shape, and are able, as a rule, to turn out castings more promptly than at any time since the beginning of the coremakers' and molders' strike.

The Standard Roller Bearing Company has begun the erection of its new foundry building, of which previous mention has been made in these columns. The building is to be two stories high, 50 x 114 feet, and will be located on the north side of the Pennsylvania Railroad, between Forty-eighth and Forty-ninth streets.

The Wm. Cramp Ship & Engine Building Company has received a contract from Wm. P. Clyde & Co., operating the Clyde Steamship Line, for the construction of a combined passenger and freight steamer to replace the Cherokee, recently stranded on Brigantine Shoals. The new vessel will be 275 feet long, 40 feet beam and 19 feet deep, and will have a gross capacity of 2676 tons. The Cramps are now under contract to build ten merchant steamships and are busy in all departments of their shipyard.

The Hess Machine Works, maker of file making machinery, notes an increased demand both from foreign and domestic sources. Orders for a number of sets of file making machines have been received, and the plant is busy in all departments. Fourteen sets of machines have just been completed for domestic delivery, while recent export shipments include one set of machines for delivery in Russia, two in Germany and several in France.

The Espen-Lucas Machine Works has made more deliveries on orders for cold saw cutting off machines and other tools during the past month than in any previous like period. Inquiries for tools are good, and in most cases lead up to business promptly. Orders taken recently are nearly all for the larger types of tools, and include a number of cold sawing machines and heavy floor boring machines. Among recent deliveries were several steel foundry and bar saws for western Pennsylvania parties. A crank shaft machine was supplied New York parties, while I-beam cold sawing machines and tool grinders have been furnished a number of other customers.

H. B. Underwood & Co. have experienced a heavy demand for portable boring bars during the past few weeks and while the demand for their other lines of railroad repair shop tools has been good it has not equalled that for boring bars. Their general repair work department also has a large amount of work in hand. The railroads are buying tools freely and business generally is considered very promising. Some recent deliveries include a portable crank pin turning machine for export to Canada and a portable boring bar for shipment to Porto Rico. A portable cylinder or dome facing machine and a large boring bar have been shipped various Southern railroads. Several portable bor-

ing bars have been delivered local and nearby roads, while a number have been furnished other roads in the Middle West.

The E. H. Mumford Company notes an exceptionally good demand for foundry molding machines from the iron and steel as well as the plumbing and the stove trades. Power and jolt ramming as well as split pattern machines appear to be in the greater demand, and orders for the various types have been taken from foundries in New England, the Middle West, as well as nearby and locally. Deliveries during January were heavy, and included a 14 x 16 split pattern power ramming machine for export to Great Britain, and several jolt ramming and other types of machinery to various domestic customers. Power ramming split pattern machines were also shipped to several local and nearby stove and plumbing supply foundries.

The Wickes Bros. Company has increased the facilities of its local branch office, adding a steam engineering department, under the supervision of Lewis Griscom. Samuel Marks and J. B. German, who are both well known in their respective fields, have also been added to the selling force. This office reports a very satisfactory volume of business during the past few weeks. Inquiries for air compressors are good, prompt shipments being made possible from their present location, which permits of carrying good stocks of these and other lines. Some recent deliveries by Wickes Bros. Company include a large Wilbraham-Baker blower, for the Florence plant of the Camden Iron Works; a Wickes 300 horse-power safety water tube boiler, separator, pumps, &c., for a Shamokin concern; a complete power equipment for a local party, and a complete 17-kw. electric generator and outfit, for Brinton & Brosius of this city.

Cincinnati Machinery Market.

CINCINNATI, OHIO, February 6, 1906.

No indications are shown of any decrease in the way of orders and the several shops are running to full capacity. Deliveries are all the way from two to four months behind, depending largely on circumstances. The export trade continues to show marked improvement and is largely responsible for the present condition of activity. Labor conditions, so far as relates to manufacturers and men in the machine tool industry, are said to be entirely satisfactory, and there are no indications that would lead one to think otherwise. If, however, the proposed coal strike predicted for April 1 should materialize it would have a very important bearing on all industries, and if continued for any length of time would necessarily result in severely restricted operations throughout the entire line of industrial development. It is said that ample provisions have been made for just such an emergency, and the large coal companies have their yards stocked with a large amount of fuel. The cold weather of the past few days has in a measure stopped work on the numerous new buildings that are now in process of erection in the city, but just as soon as spring is an assured fact developments along all structural lines will be tremendous.

The Cyclone Drilling Machinery Company, Orrville, Ohio, has for several years been engaged in the manufacture of drilling machinery, including the hollow rod process mostly used for prospecting in coal, the solid rod process, used by quarrymen and contractors, and the cable process mostly used by well drillers. The Preslar-Crawley Mfg. Company, Cincinnati, Ohio, has been engaged in the manufacture of core drills for mineral prospecting, and these drills were also used largely in making engineering tests for water works, dam sites, bridge and lighthouse foundations, &c. Each of these companies was owner of patents pertaining to drills and drilling in its different lines. On January 22 the Cyclone Drill Company, an Ohio corporation, of Orrville, Ohio, was incorporated with a capital of \$100,000, and it has bought out the assets, including machinery, merchandise, patents, &c., of the Cyclone Drilling Machinery Company and the Preslar-Crawley Mfg. Company, and hereafter the manufacturing will be done and the main business be conducted from Orrville, Ohio. The new company will make drills of all the different types, and will also make a combination drill embodying the hollow rod, cable and core drills. This will be something not now on the market, and for which there will be a great demand, because of the fact that so many different conditions can be handled with such a combination machine and it can be produced at moderate cost. The new company will increase its manufacturing plant by enlarging the building and adding considerable machinery. The directors of the company are: B. S. Cope, president; Chris. Smith, vice-president; Wm. H. Tschantz, treasurer; Wm. M. Knoppes, secretary, and Walter A. Knight.

The F. & N. Lawn Mower Company, Richmond, Ind., will in a very short time put on the market an entirely new type of riveting machine, which is claimed to have superior features. It is said to be almost noiseless in operation and the rivet head is left practically smooth, without any hammer marks or other indentations.

The Cincinnati Punch & Shear Company reports that it

has all it can do. Both domestic and foreign orders are coming forward without intermission and deliveries are several months behind. A large shipment of boiler shop equipment was last week sent to a Mexican point, punch and shearing machinery for the Navy Department to the Philippine Islands and a shipment for the Isthmian Canal Commission at Colon.

Local capital is being interested in a wheel casting plant and also a rolling mill plant, both of which are now being projected. It looks as though both of these plants were an assured fact, but definite statements cannot be made at this writing.

The contract for the machinery for the new Sinton Hotel was awarded the Prather Engineering Company, Cleveland, at a cost of \$160,000. This will include machinery for filtration, heating and ventilating, lighting and refrigeration.

The Easy Washing Machine Company, St. Marys, Ohio, is erecting a concrete-steel structure 52 x 132 feet, consisting of two stories and a basement. This building is located on the tracks of the Toledo & Ohio Central and Lake Erie & Western railroads, and will have about three times the capacity of the old plant. It will be completed and ready for occupancy in about four weeks. The company manufactures two styles of washing machines and a churn, and will add kitchen cabinets to its product. A portion of the new machinery has been purchased.

Government Purchases.

WASHINGTON, D. C., February 6, 1906.

The Bureau of Supplies and Accounts, Navy Department, Washington, will receive bids until March 6 for the following machine tools for the Portsmouth, Boston, League Island and Washington navy yards: Schedule 356, pipe cutting machine, single side dump cars; schedule 357, steam drop hammers, trimming presses, forging machine, crank shaper, die sinker, planer, milling machines, heating furnaces; schedule 358, cabinet makers' saw; schedule 359, cutting off machine, bolt cutter, air winch, melting furnace.

On March 6 proposals will be opened at the office of the Bureau of Supplies and Accounts, Navy Department, Washington, for a quantity of supplies for the Mare Island and Puget Sound navy yards, including air compressor, disk grinder, &c.

The Bureau of Supplies and Accounts, Navy Department, Washington, will receive bids until February 27 for a well boring machine, locomotive boiler, steam pumps and other supplies for the Pensacola and New Orleans navy yards.

The Isthmian Canal Commission will soon call for bids for a 14-inch engine lathe, heading and forging machine, hand bending rolls, hydraulic jacks, steam fire engine, water tube boiler and a large quantity of other supplies.

The Isthmian Canal Commission will receive bids until February 19 for a large quantity of supplies, including foundry equipment, machine tools, &c.

Under bids opened January 16 for supplies for the navy yards the Manhattan Supply Company, New York, has been awarded class 32, one combined grinding and buffing lathe, \$210, and George C. Thomas, New York, class 71, one electric hoist, \$343.

Under bids opened January 23, serial number 295, by the Isthmian Canal Commission, the Westinghouse Electric & Mfg. Company, Pittsburgh, Pa., has been awarded items 1 and 3, class 1, two 5-kw. direct connected engines and generators, \$1006.

Ball Bearing Experiments.—Recent exhaustive experiments with ball bearings have compared the operation of several different designs with each other and with ordinary sleeve bearings. The outer sleeve of the bearing was used as a brake, in order to measure the turning effort exerted upon the bearing when the shaft was in motion. A strap of soft steel, to each end of which weights could be attached, was used as a load and the turning effort measured by the difference between the weights required upon the two sides for the maintenance of equilibrium. With balls touching at but two points, the bearings give one-thirtieth the resistance to turning which is offered by the sleeve. With three points in contact, the resistance is some three times that under the first case. With bearings of balls in symmetrical contact at four points, the friction is twice as great as with three points in contact, or about one-fifth that of the sleeve. With four points of contact not arranged symmetrically the results are quite variable, the friction ranging from about the same as with the sleeve bearing to one-third of that value. Distance pieces, to enable fewer balls to be used, increase friction. Oil does not reduce friction, but by taking up dust and grit it prevents excessive wear. The best proportion of ball seems to be one-seventh of shaft diameter plus 1-12 inch.

New Work on Lake Superior Iron Ranges.

DULUTH, MINN., February 3, 1906.—Much work is under way in the Palmer district, south of Marquette, Mich. On the old Pittsburgh & Lake Superior lands, which lie adjoining Volunteer, Moore, Star West, Standard and some undeveloped lands that are supposed to contain ore, exploration is in progress. Two diamond drills have been working for several weeks, under the superintendency of Longyear & Hodge. One of these is cross cutting the entire formation adjoining More mine on the east, where the ore runs nearly across the 160 acres. This drill is to bore to the bottom of the ore body, which may be several hundred feet deep. It is thought this work may show a large amount of higher grade ore than the former pits, all of which uncovered lean silicious ores, about 30 per cent. of which was Bessemer. Another drill is working just north of Star West, where the ore formation is known to pitch to the north and where Corrigan, McKinney & Co., in a shaft on Star West, have been cutting ore that has assayed up to 65 per cent. iron. No large amount of such iron is looked for in this district; what has been found is doubtless a secondary concentration in a small seam or lens. All this work is done by the Bennett & Longyear interests, who have very extensive ore holdings on the Mesaba range. A. Maitland of Negaunee, who has just resigned from the management of mines of the Republic Iron & Steel Company, has a drill on some fee land of his, and is said to be getting satisfactory results. The Standard Mining Company, just north of the Volunteer, is drilling with one machine. Both operations are in charge of Longyear & Hodge, and they surround some of the Pittsburgh & Lake Superior tracts.

Volunteer mine, which has been handed around for some time to any one who might take it up, has been optioned to H. Roberts of Duluth, who is to put a drill or two underground and will also drive for ore in the old openings.

On the Menominee Range.

In the Menominee district the operations of the Antoine Ore Company, as an adjunct of the Republic Iron & Steel Company, have ceased, and the mines formerly operated by it are now worked by the Shenango Furnace Company, with W. A. Barrows, Jr., as general manager, and D. C. Peacock as superintendent, while E. W. Hopkins will succeed W. A. Watson as superintendent in direct charge. Mr. Hopkins has been superintendent for Oglebay, Norton & Co. for some time. Many important improvements will be made to the Antoine mines. A centrifugal crusher of 8000 tons daily capacity is going in, a big hoist has been ordered, and it is understood that the mine will produce about 250,000 tons this year, against 139,000 tons in 1905.

The Cherry Valley Iron Company is organizing its mining end and it is probable that A. F. Maitland will assume charge. Among the mines this company now operates, and in which it owns a considerable interest, are the La Rue and Croxton, both shippers; the Hobart, now being opened, and the Brunt and Nassau, not yet developed, all being on the Mesaba range. They assure the Cherry Valley Company an ore supply for a long term of years.

Superintendent W. J. Richards of Corrigan, McKinney & Co. is looking after the opening of the company's St. Paul mine on the Mesaba range, lying west of the Stevenson in section 24-57-22. The property is a considerable body of medium ore and will be equipped for large production in 1906 from one shaft. This company is also stripping its old Commodore, where it is now found cheaper to mine the ore open pit than in the old way. Its Alexandria is a new property, a small shipper during 1905. It is also developing heavily on the Menominee range. The total shipments in 1905 by this firm are very close to 2,601,000 tons, of which the Menominee range supplied, from seven mines, 712,000 tons, the rest coming from the Mesaba and one small property on the Gogebic. While it is generally conceded that there will be a considerable decrease from the Stevenson in 1906, other mines will probably more than make this up.

Pickands, Mather & Co., who have been sinking a shaft in the Deerwood district west of Duluth, have pulled their pumps and abandoned the property.

C. T. Fairbairn, who has been superintendent of the Mesaba mines of the Jones & Laughlin Steel Company, will soon become general manager of the mining division of the Republic Iron and Steel Company for the Lake Superior region, Mesaba and Menominee ranges. He will probably reside at Duluth.

Marked Increase in Average Ore Cargoes.

Through the courtesy of the executive officers of the three roads interested the following statistics are given of average cargo records at all head of the lake iron ore docks since shipments began in 1884. Reference has frequently been made to the rapid growth of capacity of the lake iron ore freighter and these records are a most interesting commentary on the fact. They represent the average weights in gross tons of all cargoes taken at the several docks.

Year.	Duluth & Iron Range.	Duluth, Missabe & Northern.	Great Northern.
1884.....	1,218	....	....
1885.....	1,417	....	....
1886.....	1,432	....	....
1887.....	1,690	....	....
1888.....	1,732	....	....
1889.....	1,789	....	....
1890.....	1,970	....	....
1891.....	1,881	....	....
1892.....	1,854	2,120	No record
1893.....	2,070	No record	No record
1894.....	2,275	No record	No shipments
1895.....	1,981	1,800	1,684
1896.....	2,285	2,202	1,707
1897.....	3,185	3,556	3,110
1898.....	3,618	3,517	3,377
1899.....	3,942	3,803	3,610
1900.....	4,187	3,783	2,639
1901.....	4,580	4,459	3,269
1902.....	4,830	4,899	3,709
1903.....	5,005	5,668	3,894
1904.....	5,443	5,272	4,628
1905.....	5,830	6,101	5,048

The average for the three systems for last year was 5666 gross tons, which is probably a far better record than any other port in the world can show for any class of commodities. None of the other lake ore shipping piers handle any such tonnage nor do any of them approach the head of the lake docks in average cargoes.

The Duluth, Missabe & Northern road has just completed the first portion of its large shops here, when it will hereafter carry on much of its repair and reconstruction of locomotives and steel cars. The shops are fitted with tools for working steel cars and differ very widely from the ordinary type of car shop throughout the country. The buildings so far completed and equipped include machine, car and blacksmith shops, storage for locomotives and transfer tables, and cover about 85,000 square feet, built and equipped at a cost of something under \$200,000. The road now has 70 heavy locomotives and 5700 cars, most of them 50-ton steel drop hoppers with air brake, and will handle from 10,000,000 to 11,000,000 tons of ore this year.

The Duluth & Iron Range road has such a pressure of business this winter in timber traffic that it has been unable to cope with it and is refusing new orders. Including the 200,000,000 feet of pine logs it will bring to Duluth saw mills, its winter business may amount to 300,000,000 feet of logs, besides many thousand cords of pulp and cord wood and hundreds of thousands of ties, poles and posts. Both this and the Duluth, Missabe & Northern roads belong to the United States Steel Corporation.

D. E. W.

Ivanhoe Furnace Changes Ownership.—The Monongahela Iron & Steel Company, Pittsburgh, Robert A. Carter, president, has purchased Ivanhoe Furnace of the New River Mineral Company, at Ivanhoe, Va. The stack is 70 x 13 feet in size and is now being relined and extensively repaired by the new owner. The furnace will be run on special iron, to be used in the plant of the Monongahela Iron & Steel Company at Pittsburgh, which makes fine grades of muck bar and merchant sizes of bar iron and also chain iron. When running on native ores the furnace will make about 80 tons a day and on Lake Superior ores about 125 tons per day.

Coal Miners Prepare for a General Strike.

INDIANAPOLIS, IND., February 5, 1906. — The United Mine Workers' International Executive Board, which was left (after the disruption of the joint conference and the adjournment of the miners' convention) to decide upon the future course to be pursued by the miners, to levy an assessment if desirable and to plan the threatened strike campaign, adjourned this evening to meet again after the anthracite conference at New York on February 15. Nothing was given out concerning the action of the board. A motion was made at the closing session of the convention to levy an assessment of \$1 a week on the members of the union to swell the strike fund. There is \$2,500,000 now available and this would be about doubled by April 1, when contracts expire, and a strike may begin. This motion was superseded by another leaving this question for the decision of the Executive Board. President Mitchell's parting words to the 1300 delegates were to go home and prepare the local branches of the United Mine Workers to take care of the financial needs of their districts for the first six weeks of the strike, without drawing on the national funds. The plan is to bring 600,000 anthracite and bituminous miners out if the strike is declared.

A resolution was adopted on motion of President Mitchell that no district under the jurisdiction of the United Mine Workers, "whether anthracite, bituminous or block coal, in the United States or Canada, shall make any agreement for a scale of wages unless all districts are included." It was said this resolution is designed to prevent any agreement unless it includes the demands of the miners in all sections of the country. It is declared that no matter what may be the disposition of the anthracite operators at the New York conference nothing more than a tentative agreement can be entered into, because the convention has declared against it.

The interstate conference movement broke up at the last meeting on Friday, February 2, when a motion by the operators to accept the proposition they made was defeated and adjournment was promptly taken *sine die*. The proposition to the miners was that they sign the present scale of wages. A sensation was created on the roll-call for the vote when the Pennsylvania delegates, through their president, Patrick Dolan, voted "yes." The conference was in a tumult immediately, delegates surrounding the Pennsylvania leader, operators to congratulate and miners to denounce him. In a convention of miners that followed the adjournment of the conference a motion was put to expel Dolan from the Miners' Union for traitorous conduct in failing to vote according to the instructions of his district for 12½ per cent. increase in wages. After a warm debate and explanations by Dolan the motion was laid on the table, but a resolution reprimanding the president and vice-president of the Pennsylvania district was carried.

The Southwestern conference also failed to reach an agreement and the miners refused an offer of arbitration made by the operators, the Arbitration Board to be composed of one Judge of the Supreme Courts of Missouri, Kansas, Arkansas, Texas and one from the Court of Appeals of Indian Territory.

PITTSBURGH, PA., February 5, 1906. — President Patrick Dolan, in the district convention of the United Mine Workers to-day, defends his vote at Indianapolis in favor of accepting the present scale of wages. He said: "What shape are you in for a strike? Why doesn't Mitchell tell you that there are 75,000 nonunion miners along the Pennsylvania Railroad between Pittsburgh and Johnstown? I tell it to you, and I tell you you cannot afford to strike now. Ten years ago you were getting 45 cents a ton for pick mining. To-day you are getting 67½ cents for machine mining and you won't load the wagons after the machine for less than 47 cents. Are you going to throw away all you have gained in these years? You will have the camps and the relief fund again if you do. I tell you you are not in shape for a strike."

Development in electric traction in and around Manchester, England, has lately been exceedingly rapid and it is now possible to cover the 40 miles to Leeds by trolley cars. The development of electricity for power and lighting has been equally rapid, the Manchester municipality

having about 300 miles of mains in service. It is thought that the power supply will be much taxed in the near future, as heavy demands are coming in for electric power to be supplied for driving cotton mills and other factories, for pumping and a variety of other uses. The whole of Lancashire seems to be becoming electrified.

The American Can Company's Report.

The American Can Company has issued its annual statement for the year ended December 31, 1905. The company having changed its fiscal year from March 31 to December 31, this year's figures (which are for nine months) are compared with those for the years ended March 31, 1905 and 1904, as follows:

	9 months Dec. 31, '05.	Year ending March 31. 1905.	1904.
Net profits.....	\$2,311,417	\$2,896,917	\$2,394,510
<i>Assets.</i>			
Plants, &c.....	\$74,854,299	\$75,018,966	\$75,030,694
Improvements and construction	3,376,043	2,858,212	2,747,745
Other investments.....	649,299	381,275	485,615
Cash	3,311,519	1,440,627	1,845,899
Bills and accounts receivable	1,273,957	1,207,835	1,480,551
Merchandise inventory...	4,285,389	6,268,877	5,218,104
Totals.....	\$87,750,506	\$87,175,792	\$86,808,608
<i>Liabilities.</i>			
Preferred stock.....	\$41,233,300	\$41,233,300	\$41,233,300
Common stock.....	41,233,300	41,233,300	41,233,300
Accounts payable.....	721,478	911,932	864,584
Dividends	515,416	515,416	1,030,832
Surplus	4,047,012	3,281,844	2,446,591
Totals.....	\$87,750,506	\$87,175,792	\$86,808,608

The report gives the following figures for nine months ended December 31, 1905:

Earnings	\$2,524,136
Written off for depreciation.....	212,719
Net profits.....	\$2,311,417

In his remarks President Graham says:

"Since the report made as of March 31 last we have expended in extension \$565,881.87, the principal items of which are: Office and factory site and partial construction of building, Fourteenth street, New York; factory site and building, Lubec, Maine; factory sites, New Orleans, La., Savannah, Ga., and Chicago, Ill.

"The Fourteenth street property will be occupied May 1 as a manufacturing plant, taking over the equipment now in rented property on Jane street, and as the home and general offices. The Lubec factory is practically completed and will be in operation within a few weeks. The New Orleans and Savannah sites will be built on at once and the Chicago site within the year. These expenditures for new property have been necessary to keep pace with the growing business, and, with others made on going plants, should result in material economies and increase of the earning power of the company.

"There has been expended during these nine months (and aside from repairs and maintenance) the sum of \$95,854.92 in betterments, which has gone directly into operating charges, but we have also written off \$212,718.58 for depreciation, though the physical condition of the properties has been improved and is now better than ever before.

"It is gratifying to state that the most important matters of litigation in which the company has been involved have now been decided in its favor; in some cases its patents have been sustained and infringements enjoined, and in others its right to the use of valuable processes, which was attacked, maintained."

To stop a leak in a steamer which struck a rock in the Straits of Magellan, recourse was had to timber, canvas, ballast rock and Portland cement, which formed so effective a cork that the vessel was enabled to proceed on its voyage and was finally taken to Newport News for repairs. It was found that the filling was so solid that with ordinary appliances some six weeks would have been consumed in chipping it out. To overcome this difficulty small charges of dynamite were used, and after three days of blasting, without injury to the vessel or the dock, the mass of material was so completely loosened up as to permit of being removed.

The Pittsburgh Foundrymen's Association.

This organization has adopted the plan of having its monthly meetings preceded by a dinner. The scheme has proved successful, the attendance being larger than heretofore and the interest in the meetings much greater. The regular monthly meeting was held Monday evening, February 5, in the Hotel Henry, Pittsburgh, about 75 members being present. D. B. Fuller, president, was in the chair and F. H. Zimmers was secretary.

Two papers were presented. The first was by W. A. Bole, superintendent of the Westinghouse Machine Company, East Pittsburgh, and was entitled "Foundry Practice." It was very interesting and after its reading was thoroughly discussed. The second paper was entitled "Foundry Problems" and was read by Dr. Richard Moldenke, Watchung, N. J., secretary of the American Foundrymen's Association. Dr. Moldenke's paper closely held the attention of his hearers and was followed by a general discussion of the problems presented in it.

The secretary announced that at the March meeting a paper would be read by H. E. Field of Mackintosh, Hemphill & Co., entitled "Amount of Loam and Clay Required in Molding Sand."

The president announced that at the April meeting a banquet would be held and a reception tendered to the members of the Philadelphia Foundrymen's Association and New England Foundrymen's Association, this being a return of courtesies extended to the Pittsburgh Foundrymen's Association last year by these two bodies. A committee consisting of F. H. Zimmers of the Union Foundry & Machine Company, W. H. McFadden of Mackintosh, Hemphill & Co., and A. W. Slocum of the National Car Wheel Company was appointed to make arrangements for the entertainment of the visitors.

The Illinois Steel Company's Improvements.

The Chicago, Lake Shore & Eastern Railroad, the terminal road of the Illinois Steel Company, is preparing to extend its tracks from Bluffington, where the new cement plant of this company is located, to the site of the new steel plant to be erected in Indiana, on Lake Michigan. This property is situated in the township north of Tolleston, Ind., outside of the confines of the latter place, 30 miles from Chicago, and the new industrial town to be built has not yet been named. As soon as the terminal extension has been completed work on the erection of two of the eight blast furnaces, a section of the open hearth plant and the new rail mill will be commenced. Trunk lines passing through Tolleston are already purchasing property for extensive terminals to take care of the heavy freight tonnage that will originate at this point. The Pennsylvania Railroad has already secured an extensive tract, and it is probable that the Elgin, Joliet & Eastern will also lay an extension to this plant.

At the South Works the installation of the new 38-inch universal plate mill will be made in record time, as nearly all the machinery is already on the ground. Several years ago it was decided to install this mill and some of the machinery was purchased, but adverse business conditions resulted in a delay. Some of the contracts for the new light rail mill to be installed at the South Works have already been made, and the mill will be ready for operation during the present year.

American Rights in Gröndal and Kjellin Patents.

—The American Gröndal-Kjellin Company, New York, was incorporated at Albany the past week with a capital of \$100,000. The directors, who are nearly all members of the firm of Naylor, Benzoni & Co., London, or Naylor & Co., New York, are the following: John Hay and E. A. Hay, London; J. M. Clark, Simon H. Stern, J. A. Rawlins, W. H. Mills and A. H. Strong, New York. The company has the American and Canadian rights for the Gröndal process of concentrating and briquetting fine ores, the Kjellin electric furnace and the Gröndal kiln and process for charring wood, with recovery of by-products of charcoal manufacture.

Labor Notes.

The strike of the Housesmiths and Bridgemen's Union against the members of the Building Trades Employers' Association in New York, which has continued for the past two months, took a more serious turn on Friday night, February 2, when at a meeting of delegates of the Central Federated Union, it was resolved to declare a general building strike in New York on February 15 in support of the housesmiths. The extent to which the Central Federated Union can control the building trades is the question of immediate interest to the Employers' Association. The unions are bound by arbitration agreements and not all of the building trades are represented in the Central Federated Union. There are enough important unions in the central body, however, to tie up building operations in New York if these unions are governed by the resolution just adopted. Some employers have expressed the opinion that the action of the Central Federated Union will amount to nothing; that the leaders of the unions would not be drawn in this way into a general strike. If the building trades unions should support the Central Federated Union it would mean idleness for about 100,000 men in New York City.

The first conviction resulting from the troubles between the New York structural contractors and the Housesmiths' and Bridgemen's Union was secured February 1 in the Court of General Sessions, when a jury returned a verdict finding David Marks guilty of assault in the second degree. He was sentenced to three years and three months in the State prison. He was a member of the union's "entertainment committee," which the late Sam Parks instituted. On the night of December 2 the prisoner, with two other members of the "committee," went to the building of the American Can Company, at Tenth avenue and Fourteenth street, to "do their duty," as it was expressed during the trial. There the three men attacked Charles A. Scott, a watchman. During the fight Marks drew a revolver and fired three shots. The other two union men are in the Tombs awaiting trial.

Two picketing bills have been introduced in the Massachusetts Legislature. One is favored by the Employers' Association of Springfield, which is to be represented at a hearing on the bill at Boston on February 14. The bill provides that, "No person shall by intimidation or force prevent or seek to prevent a person from entering into or continuing in the employment of any person or corporation. Threat of loss of employment, or threat to obstruct or prevent the obtaining of employment, or threat to injure or interfere with the business of any employer to compel him to discharge from employment or to refrain from employing any person, shall be intimidation within the meaning of this section. Whoever violates any provision of this section shall be punished by a fine of not more than \$50 for each offence." Another bill is favored by the labor unions and provides as follows: "In case of a strike or lockout or other dispute between an employer and his employees it shall be lawful for the employees or for other persons to walk upon the public streets and ways in the vicinity of the place of employment or in any other place to which they have lawful access, and in a peaceful way to converse with persons intending to go to such employer for work, for the purpose of informing them of actual facts in order to induce them not to enter into or not to continue in said employer's service."

The contemplated construction of several large war ships for the German Navy makes it likely that two large locks will be built at the entrances to the Kaiser Wilhelm Canal, with a length of 633 feet each, to replace those of 500 feet now in service. The change, it is estimated, will take four or five years, but is demanded because the present locks are unable to handle the proposed new ships. It is also proposed to remove a part of the Vulcan Shipbuilding Company, now located at Stettin, to a site near Hamburg, since the River Oder is too shallow for ships of great draft. In addition a 35,500-ton floating dry dock is to be constructed at once, at Hamburg.

The New British Parliament.

The London *Iron and Coal Trades Review* makes the following comments on some results of the late Parliamentary election in Great Britain:

So far as the employers are concerned, the general election has, up to the present time, a sorry tale to tell. Most of those who were more or less typical representatives of the iron and allied industries in the House of Commons have suffered defeat. This has been the case with Sir Alfred Hickman, Bart., the owner of the largest steel works and the most successful blast furnace plant in the Midlands, who will be greatly missed, both by the House of Commons and by the great interests of which he was so efficient an exponent and representative. Arthur H. Heath, himself one of the largest employers in Staffordshire, and perhaps, in conjunction with his brothers, Robert and Sir James, absolutely the largest employer in the immediate neighborhood of Hanley, for which he sat in the last Parliament, has suffered defeat at the hands of the president of the local miners' association. Mr. Heath's services to the iron and coal interests are generally appreciated, and he is an equally valuable executive member of the Mining Association of Great Britain and of the British Iron Trade Association, being, indeed, the president of the latter body. Sir Thomas Wrightson, of the distinguished firm of Head, Wrightson & Co., of the Teesdale Iron Works, Stockton-on-Tees, has lost his seat for East St. Pancras, despite his efforts to ameliorate the conditions of labor and his expert knowledge of industrial questions. Colonel J. R. Wright, of the firm of Wright, Butler & Co., of the Elba Steel Works and the works of Landore (now incorporated in the firm of Baldwin & Co.) has tried conclusions unsuccessfully at Swansea, where he is a large employer of labor. Sir Lees Knowles, the well known coal owner, has been rejected at West Salford, despite his leading position in the coal trade of Lancashire. Sir A. Seale Haslam, the well known manufacturing engineer and inventor, has lost his seat for Newcastle-under-Lyme. G. H. Cloughton, chief mining agent for Earl Dudley, has failed in his candidature for the borough where his name is a household word, where he is much esteemed, and where he is virtually the leading employer. W. J. Galloway, one of the notable firm of Galloways, Limited, the great boiler manufacturers of Manchester, has lost his seat for the southwestern section of that city. Sir W. E. M. Tomlinson, who has for many years sat for Preston, near which he owns large colliery interests, and who has taken an effective part in public affairs as president of the Railway and Canal Traffic Association, has ceased to sit for a constituency to which he was almost believed to enjoy the perpetual reversion. And so with some lesser lights. The conservative employing interests have been to a large extent defeated, not by liberals so-called, but by labor candidates, and thereby hangs a tale which is likely to be unfolded in the near future.

There seems to be no cessation in the business going to the Lake shipyards. Following a recent order for three 605-foot steamers given by the Weston Transit Company, a contract was placed last week with the American Shipbuilding Company for a 7500-ton vessel for 1907 delivery. The latter company's yards are completely filled with work for 1906 and the new boat will not be delivered until April 1, 1907. It will be 440 feet over all, 52 feet beam and 28 feet deep. The names of the owners are not given. The boat will be a duplicate of the W. G. Pollock which was ordered some time ago by W. H. Becker and follows the ideas of those who are rather conservative as to the size of Lake freighters.

Corrigan, McKinney & Co. of Cleveland, Ohio, blew in their Genesee furnace, formerly Charlotte, at Charlotte, N. Y., on January 24, after repairs. This company's River furnace at Cleveland, blown out in December for relining, was started up on February 3.

Samuel Mather of Pickands, Mather & Co., Cleveland, Ohio, has sailed for Europe.

CONTENTS.

	PAGE.
Remarkable Tire Turning. Illustrated.....	487
The Lawson Cheap Copper Scares.....	489
Nickel Steel and Its Application to Boiler Construction....	490
The Sterling Coal & Coke Company.....	491
The American Heavy Manufacturing Shaper. Illustrated....	492
More Pleasure or More Business Automobiles?.....	493
Refractory Uses of Bauxite.....	494
Customs Affairs.....	495
The New York Rubbish Incinerating Plant. Illustrated....	496
Inspection of Winslow Brothers Company's Plant.....	499
Mexican Railroad and Business Notes.....	500
Cutting an Irregular Box Cam with the Aid of an Air Drill. Illustrated.....	501
The Revision of the Canadian Tariff.....	502
Blast Furnace Charging Apparatus. Illustrated.....	505
National Tube Company Improvements.....	505
New Publications.....	506
Sturtevant Vertical Engines. Illustrated.....	506
The Magnesite Deposits of California.....	507
A Light Traveling Hand Crane. Illustrated.....	508
The Billings & Spencer Cutting Off Tool. Illustrated....	508
The Shenango Furnace Company.....	508
Curve Wear of Rails on the Boston Elevated.....	508
Production of Steel Rails and of Bessemer Ingots in 1905..	509
The Foundry Trade School.....	509
The Production of Pig Iron in 1905.....	510
Iron and Steel Exports and Imports in 1905.....	511
Lake Copper Mine Equipment.....	511
Editorial:	
A Remarkable Building Movement.....	512
Relative Foundry Iron Prices at Chicago.....	512
Open Hearth Practice Getting the Preference.....	513
Public Interest in Forest Preservation.....	513
Pig and Bessemer Steel in 1905.....	514
Correspondence.....	514
Zug & Co., Limited.....	515
The Steel Wool Test Case.....	515
Blast Furnaces Under Construction.....	515
Sydney Rod Mill Records.....	515
Frederick T. Towne. Portrait.....	516
Metallurgical Problems in the Foundry.....	516
Iron and Steel in Canada.....	517
Refractories and Fire Brick.....	518
Obituary.....	519
Personal.....	519
News of the Works:	
Iron and Steel.....	520
General Machinery.....	520
Power Plant Equipment.....	520
Foundries.....	521
Bridges and Buildings.....	521
Fires.....	521
Hardware.....	521
Miscellaneous.....	521
The Iron and Metal Trades:	
A Comparison of Prices.....	522
Chicago.....	522
Philadelphia.....	524
Pittsburgh.....	525
Cleveland.....	527
Cincinnati.....	527
Birmingham.....	528
New York.....	528
Metal Market.....	529
Iron and Industrial Stocks.....	529
Trade Publications.....	529
The Machinery Trade:	
New York Machinery Market.....	530
New England Machinery Market.....	531
Philadelphia Machinery Market.....	532
Cincinnati Machinery Market.....	533
Government Purchases.....	533
Ball Bearing Experiments.....	533
New Work on Lake Superior Iron Ranges.....	534
Ivanhoe Furnace Changes Ownership.....	534
Coal Miners Prepare for a General Strike.....	535
The American Can Company's Report.....	535
The Pittsburgh Foundrymen's Association.....	536
The Illinois Steel Company's Improvements.....	536
American Rights in Gröndal and Kjellin Patents.....	536
Labor Notes.....	536
The New British Parliament.....	537
Hardware:	
Condition of Trade.....	538
Notes on Prices.....	539
Hardware Association in Delaware.....	541
The Pennsylvania Association.....	541
Trade Items.....	541
North Dakota Retail Hardware Association. Portraits..	542
Convention Notes.....	550
Coming Hardware Conventions.....	550
Parcels Post Campaign.....	551
The Proposed Catalogue of the Western Heavy Hardware Jobbers.....	552
Trout Hardware Company.....	553
Death of Alfred M. Wright. Portrait.....	553
Letters from the Trade.....	554
Price-Lists, Circulars, &c.....	555
Requests for Catalogues, &c.....	555
Among the Hardware Trade.....	556
Miscellaneous Notes:	
Smith & Hemenway Company.....	556
Glucio-Glue and Gluco-Glutin.....	556
Improved Three-Coin Registering Savings Banks. Illus.	556
Combined Lock, Latch, Hasp and Staple. Illustrated..	556
Combined Salt Shaker and Pepper Grinder. Illus....	557
Porter's Meadow King Hay Carrier. Illustrated.....	557
The Longden Magnetic Tack Hammer. Illustrated.....	557
The Bishop Automatic Saw Filer for Bevel Filing. Ill.	558
Crisp Cross Flue and Gun Cleaners. Illustrated.....	558
Imperial-Wilxon Double Cylinder Compound Air Pump. Illustrated.....	559
Planet, Jr., Two-Horse Pivot Wheel Riding Cultivator, Plow, Furrower and Ridger No. 74. Illustrated....	559
Current Hardware Prices.....	560

HARDWARE

THE indications are that the meetings of the retail hardware associations this year, most of which occur the present month, will give impressive demonstration of the significance and importance of the movement which they represent. Those already held show how far-reaching territorially is the organization of the retail merchants, as in the van leading many States more centrally located are the associations of Texas, North Dakota, Washington and Idaho. The annual meetings of other associations largely in the West crowd into February and make it distinctively the convention month. Those in charge of these gatherings have in many cases been making special efforts to increase the membership, and where this is undertaken under wise and energetic direction the result is almost invariably a material strengthening of the organization. This species of enterprise like many another will prosper if it is only pushed. During the past year there has been much work done and the associations have, we believe, made marked progress.

The officials and committees charged with responsibility in regard to the meetings have in several instances manifested resourcefulness and energy in their efforts to arrange an attractive programme and to secure a large attendance, so that there is a probability that a new record in this respect will in many States be established. It will be well worth while for manufacturers and jobbers to study carefully the features of this movement and the spirit which animates its gatherings, for the feeling and attitude of the retail trade has much to do in determining the course of things in the trade at large. The reports of these conventions will therefore be well deserving careful perusal.

These gatherings are when well ordered distinguished by a decidedly businesslike character, as more and more attention is given to practical subjects and the mutual giving and receiving of information and suggestions, which can be applied by the merchants in their own stores. Less attention is given than at one time to the intrusion into the retailers' field of competition of which he has a right to complain, whether it be from the jobber, the catalogue house or the manufacturer. One reason for this is in the fact that such competition has to a certain extent been diminished and the evils thus complained of somewhat mitigated. Another and more important reason is in the general recognition that the retailer's prime duty is to put into his own business an amount of enterprise and energy which will make illegitimate competition less easy and profitable and at the same time tend to make his business better in its methods, wider in its reach and more remunerative in its results.

This tendency toward the practical shows itself this year in the programmes for the annual meetings of the associations. A few years ago the retail merchants, following the lead of the jobbers in some of their earlier conventions, arranged for a formidable array of papers and formal addresses, many of which were no doubt of merit and in many cases of a practical and instructive character. This year there are apparently to be less of such papers and addresses than previously, the effort being to make the gathering distinctly practical and helpful in a definite way to the merchants. The aim is to

make the meetings contain so much that the merchants can apply or adapt in the advancement of their own interests that those who are present will go home with the feeling that they have been amply repaid for the time, trouble and expense involved in their attendance.

This practical side of association work is in all respects most commendable and, tending as it does to make the members better merchants, will dignify the movement and render it a pronounced and permanent success. Whatever other advantages may be found in the associations as a means of fighting trade abuses or cultivating fraternal relations with fellow merchants and with jobbers and manufacturers, it must be remembered that one of the objects which alone would justify retail organization is the direct contribution of the association to the efficiency and success of the individual merchants. The association is the coming together of business men for business purposes, and the business of each should in a definite way be benefited.

Condition of Trade.

The retrospect of January strengthens the impression of it as an exceptionally good month, both manufacturers and jobbers finding the aggregate of its business exceedingly satisfactory. At the present time there continues to be an active demand, and the jobbers are placing orders freely and for considerably more than the usual quantities of goods. They are evidently getting into position to enter on the spring trade with large stocks and prepared for an early and liberal buying by the retail merchants. Under these conditions, with the strength of the market in the raw material, prices in nearly all lines of Hardware are steady and in some cases strong. In Heavy Hardware especially there is a growing difficulty in obtaining some kinds of goods, as manufacturers are falling behind their orders. In general and shelf lines, including tools of practically all kinds, the trade is taxing the capacity of the factories. Thus far certainly the year does not contradict the promise with which it opened. In this state of things there is an opportunity presented to merchants and manufacturers to strengthen their individual positions and to advance their business interests. It is gratifying to note the enterprise and energy with which this is being done. One of the features of the situation is the conservatism of the leading manufacturers in resisting the temptation to advance prices when such action on their part would be permitted by the existing state of the market and would indeed be welcomed by many of the jobbing trade. The wisdom, however, of keeping values down to a reasonable and fairly remunerative level is undeniable, as tending to prolong the duration of satisfactory and prosperous conditions in the market on the goods in question.

Chicago.

January has been another record breaking month in the Western Hardware trade, jobbers generally reporting that the volume of business exceeded that of any like period in their history, although the total falls somewhat below records established last fall, which is not surprising, as January is usually a light month. Merchants are buying heavily for future requirements, which would indicate a healthy movement of winter goods, although weather conditions have been extremely unfavorable, and it was believed would leave heavy stocks to carry over. Stoves

and accessories were largely moved from floors during the fall months, consumers anticipating their needs in these lines, but outside of Snow Shovels, Sleds and other lines that only move with severe weather stocks of winter goods are generally light. On the other hand, Mechanics' Tools such as are used in outdoor work have been in heavy demand throughout the Winter and the trade that has been lost on account of the mild weather has more than been made up by the increased demand in the lines enumerated. Jobbers and manufacturers report that moderate buying has already begun for the fall season, merchants beginning to place orders for Heaters, Stoves and accessories. Prices have already been fixed on Stove Pipe, Elbows, &c., but on Stove Boards no announcement has yet been made of this year's schedule. The advance on Stoves, amounting to 5 per cent., announced by Western manufacturers last month, is not being rigidly adhered to, not only by distributors but by makers as well, and this is surprising on account of the high prices prevailing for raw material. Quotations on Wood Screws are firmer than for many months. Merchants are anticipating a big spring and summer trade in Wire Cloth, Poultry Netting and Fencing, judging from the volume of their orders, and the early distribution of this material will greatly relieve the pressure on the mills and jobbers which is customary in the spring months. At the meeting of the Cut Nail manufacturers, held last week, prices were advanced \$1 a ton, the high prices prevailing for raw material being the cause of this advance rather than prevailing demand. Iron Bars are easier and distributors are holding quotations from store and no change will be made for at least a month. Demand for Steel Bars and Light Shapes from warehouse on account of deferred mill shipments is insistent and the heavy production is by no means keeping pace with consumption. Collections throughout this territory since the first of the year have been good and financial conditions generally could not be improved.

NOTES ON PRICES.

Wire Nails.—Favored by an absence of continued or frequent storms, mills have been enabled to make heavy shipments, which will do much toward relieving the usual spring congestion. Demand is larger than usual at this season, while orders in the hands of mills are said to be greater than the stocks on hand. Quotations are as follows, f.o.b. Pittsburgh, plus actual freight to point of delivery, 60 days, or 2 per cent. discount for cash in 10 days:

Carloads to jobbers.....\$1.85
Carload lots to retail merchants..... 1.90

New York.—The month of January was exceptional in the distribution of Nails in small lots from store, owing to the continued favorable weather for outdoor work on buildings. The recent colder weather has reduced demand to some extent. Prices are fairly well maintained. Quotations on small lots from store are on the basis of \$2.10 per keg.

Chicago.—So far as production is concerned, the last month was the biggest January in the history of the Wire trade, and Wire Nails shared in this proportionate increase in output. Orders at present on the books of the manufacturers already exceed stocks on hand, which is an unusual condition at this season of the year and goes to accentuate the reports of the heavy distribution up to date. The present weather conditions are welcomed by producers after the long unseasonable period, which was unfavorable to the distribution of winter goods and which to a large extent has retarded the movement of stocks laid in by dealers. Naturally a brief period of severe weather will help the movement of these stocks and which will naturally be reflected in the volume of spring buying. Of course this refers more to Hardware lines than it does to Wire Nails, the sale of which has been unusually heavy for the winter season. Quotations are unchanged as follows: \$2 in car lots to jobbers and \$2.05 in car lots to retailers, with an advance of 5 cents for less than car lots from mill.

Pittsburgh.—We note a seasonable demand larger than usual at this season of the year, and as the mills have

been favored by pleasant weather and shipments have been unusually heavy, the trade anticipates less trouble in getting prompt deliveries of Wire Nails when spring trade starts. The market is firm but unchanged, and it is possible an advance in prices may be made by the mills this month. We quote Wire Nails at \$1.85 in carloads to the large jobbing trade and \$1.90 in carloads to retail merchants, f.o.b. Pittsburgh, plus actual freight to point of delivery, terms 60 days, less 2 per cent. off for cash in 10 days.

Cut Nails.—The price of Cut Nails was advanced \$1 per ton at the meeting of the Cut Nail Association, held last week. The manufacturers, almost without exception, were favorably inclined toward an advance, owing to general conditions and to the policy of generally keeping the price of Cut Nails near that of Wire Nails. Current demand is only fair, but buyers are specifying quite freely on contract orders. Revised quotations are as follows: \$1.80, base, for carload lots, f.o.b. Pittsburgh; \$1.85 for less than carloads, f.o.b. Pittsburgh; \$1.95 for carload lots, on dock, New York; \$2.00 for less than carloads, on dock, New York. Iron Cut Nails at points west of Buffalo and Pittsburgh are held at 5 to 10 cents advance on Steel Cut Nails.

New York.—An advance in Cut Nail prices, of 5 cents per keg, was made at the meeting of the Cut Nail Association, held last week. Demand in the local market is moderate, and prices are fairly well maintained. Revised quotations for small lots from store are on the basis of \$2 per keg.

Chicago.—At the meeting of the Cut Nail Association, held last week, both Iron and Steel Nails were advanced \$1 a ton. This action was anticipated by the trade on account of the high prices ruling for raw material. The open weather this winter has been favorable to a wide distribution and will to some extent reduce the usually large movement during the spring months. We revise quotations as follows: Steel Cut Nails, in car lots, \$1.90 to \$1.95; less than car lots, \$2; Iron Cut Nails, \$2 to \$2.05.

Pittsburgh.—A meeting of the Cut Nail Association was held on Wednesday, January 31, at which an advance of \$1 per ton was made in prices. Current business is fairly large and the mills have a good many contracts, on which buyers are specifying very freely. The market is firm, the mills maintaining official prices. Revised quotations are as follows: \$1.80, base, for carload lots, f.o.b. Pittsburgh; \$1.85 for less than carloads, f.o.b. Pittsburgh; \$1.95 for carload lots, on dock, New York; \$2 for less than carloads, on dock, New York. Iron Cut Nails at points west of Buffalo and Pittsburgh are held at 5 to 10 cents advance on Steel Cut Nails.

Barb Wire.—New business is moderate as received by the mills. Specifications on contract orders are large. Quotations are as follows, f.o.b. Pittsburgh, 60 days, or 2 per cent. discount for cash in 10 days:

	Painted.	Galv.
Jobbers, carload lots.....	\$2.00	\$2.30
Retailers, carload lots.....	2.05	2.35
Retailers, less than carload lots.....	2.15	2.45

Chicago.—The new tonnage that is reaching the mills is fairly heavy and the outlook for a heavy demand during the spring months is unusually bright. Jobbers are already anticipating shipments and mill specifications are in excess of output. Quotations are unchanged, as follows: To jobbers, Chicago, car lots, Painted, \$2.15; Galvanized, \$2.45. To retailers, car lots, Painted, \$2.20; Galvanized, \$2.50. Retailers, less than car lots, Painted, \$2.30; Galvanized, \$2.60. Staples, Bright, in car lots, to jobbers, \$2.10; Galvanized, \$2.40; car lots, to retailers, 10 cents extra, with an additional 5 cents for less than car lots.

Pittsburgh.—Specifications on contracts continue to come in very freely, but new business is only fair. The large trade covered heavily before the advance in prices and the mills are now filling these orders. There is some talk of an advance in prices of Barb Wire this month, but nothing official has been given out. The market is firm, as follows: Painted Barb Wire \$2 and Galvanized \$2.30 in carload lots to the large jobbing trade, with the usual ad-

vance of \$1 a ton to retailers in carload lots, f.o.b. Pittsburgh, 60 days, or 2 per cent. off for cash in 10 days.

Smooth Fence Wire.—Mills are most largely engaged in filling specifications on contract orders, which were placed some time since. Quotations are as follows, f.o.b. Pittsburgh, 60 days, or 2 per cent. discount for cash in 10 days:

Jobbers, carloads\$1.70
Retailers, carloads 1.75

The foregoing prices are for base numbers, 6 to 9. The other numbers of Plain and Galvanized Wire take the usual advances, as follows:

	6 to 9	10	11	12	12½	13	14	15	16
Annealed.....Base	\$0.05	.10	.15	.25	.35	.45	.55		
Galvanized.....	\$0.30	.35	.40	.45	.55	.65	1.05	1.15	

Chicago.—Practically all of the manufacturers of Fencing have placed their contracts with the mills for the present season, and that they continue to specify freely indicates that they are making up larger stocks than heretofore. Quotations are unchanged, as follows: To jobbers, \$1.85, f.o.b. Chicago, in car lots, and car lots to retailers, \$1.90.

Pittsburgh.—The Fence makers had placed large contracts for Fencing Wire before the advance in prices and are now specifying on these contracts very freely. Current business is of fair volume, but the mills are running mostly on old orders. It is anticipated that spring trade this year will be very heavy. Prices are firm but unchanged. Quotations are as follows, f.o.b. Pittsburgh, 60 days, or 2 per cent. discount for cash in 10 days:

Jobbers, carloads\$1.70
Retailers, carloads 1.75

The above prices are for base numbers, 6 to 9.

Bellows.—Somewhat higher prices are being demanded for Blacksmiths' Bellows as a natural result of the increased cost of leather and other materials. There are indications that leading manufacturers are taking concerted action in withdrawing low quotations and announcing somewhat advanced prices.

Cleavers.—Some of the principal manufacturers of Butchers' Cleavers and Choppers have issued a revised price-list on these goods, which went into effect February 1. The purpose of the revision was to do away with inequalities which had developed in the former list and to secure prices more in conformity with cost.

Spring Hinges.—The market for Holdback Spring Hinges remains about on the level established last fall. Prices are low, but it is doubtful if competition is quite as sharp as it was two or three months ago. Some idea of the character of the market may be gained from the fact that prices to fair retail trade to-day are about the same as the extreme jobbers' prices prevailing a year ago.

Wire Hat and Coat Hooks.—Prices on Wire Hat and Coat Hooks and Ceiling Hooks show marked firmness. Manufacturers report a very large volume of trade, and some are said to be so pressed with business that they are unwilling to book new orders at present prices, although representing an advance of 5 per cent. or more over those prevailing a month or six weeks ago.

Mica.—Buyers who are in the market for Stove Mica state that producers show a disposition to withhold quotations, and the outlook is for higher prices. Consumption of Mica has increased rapidly, especially as regards its use in connection with electricity. For this reason the demand from Stove manufacturers, once of primary importance, has assumed a secondary position. Producers also claim that Stove manufacturers demand a higher grade of Mica than is required for other purposes, and should be willing to pay for it.

Rolled Thread Carriage Bolts.—It is reported that a meeting of manufacturers producing Rolled Thread Bolts was lately held, and an extreme price of 75 and 10 per cent. discount was agreed upon, covering ¾ x 6 and smaller sizes. This represents a considerable stiffening of the market, as prices on goods of this character have been more or less irregular.

Builders' Hardware.—The manufacturers of Builders' Hardware, under date February 3, announce that on and after March 1, 1906, prices on all schedule quotations and schedule orders will be advanced 10 per cent. beyond

the prices of goods intended for stock. Until March 1, 1906, orders will be accepted based on schedule estimates given by manufacturers since January 1 last, if such order covers a complete specification for the goods and particularizes the name and location of the building for which the material is intended. On and after March 1 next all schedule estimates then outstanding will be abrogated and no schedule orders will be accepted except on the basis of the new prices effective March 1, 1906. It will be recalled that an advance of 10 per cent. was promulgated about a month ago on goods on schedule and contract orders where the goods were tagged or labeled in detail for convenience of the workman or contractor. That advance has been rescinded and the present 10 per cent. advance supersedes it. In effect the change favors the regular dealer, wholesale or retail, who may carry the goods involved in stock, as against the broker who merely receives and transmits an order without having a store or carrying stock.

Heavy Hammers.—The market for Heavy Hammers appears to be in a more satisfactory condition than for some time, and prices, while comparatively low, are well maintained by the manufacturers. Practically the only irregularities in current prices are in those made by the jobbing trade, who are enabled to make concessions to their customers, in view of purchases some time ago at lower prices than now prevail. Under these conditions the paragraph in our last issue on this subject was in error in referring whatever there is of irregularity to the failure of the manufacturers to work in harmony, the fact being that while they unite in establishing low prices considering the cost of the material, there is less irregularity in quotations than during the past year or two. In avoiding advances which might readily be made they are pursuing a wise and conservative course, which should meet the approval of the trade and tend to assure the stability of prevailing prices.

Spring Balances.—John Chatillon & Sons, 85-93 Cliff street, New York, announce an advance of 10 per cent. February 1 on their Spring Balances, classes A, A1, A2 and C. A similar advance has been made by the other manufacturers.

Sheet Zinc.—Under date, 5th inst., Matthiessen & Hegeler Zinc Company, La Salle, Ill., announces a reduction in price to \$7.75 per 100 lbs., f.o.b. La Salle, for Sheet Zinc in 600-lb. casks, subject to the following discounts for cash and quantity:

	Cash with order.	Quantity. Per cent.	Total. Per cent.
Carload lots.....	3	5	8
9000-pound lots.....	3	3	6
6000-pound lots.....	3	2	5
3000-pound lots.....	3	1	4
Less than 3000 pounds.....	3	0	3

Binder Twine.—The situation in the Binder Twine market since the first of the year has been similar to that of the corresponding period of 1905. No prices have been announced by the International Harvester Company, which is the largest factor in the manufacture of Twine, but it is understood that the company has booked a considerable amount of business on the basis of memorandum or priceless orders and that the same is true of some wholesale concerns handling Twine. There has been a growing and somewhat widespread sentiment among the trade against the practice of placing memorandum orders. At Implement conventions in the West this feeling has found expression in opposition to the priceless contract developed in the discussion of the subject. Many merchants have refused to consider any Twine proposition without prices, so that it has not been so easy to obtain orders as it was two or three years ago. Prices have been made by some of the smaller manufacturers which are equivalent to 9 to 9½ cents per pound for Sisal and Standard Twine, f.o.b. Eastern factory.

Rope.—The demand during January was exceptionally good for the season, owing, to some extent, to the open weather which prevailed. Thus far during the present month the amount of business received by manufacturers has been gratifying. Prices are fairly well maintained and probably to a greater extent than if

business had been smaller. Quotations are as follows: Pure Manila, 12½ cents; B quality, 11½ cents; Pure Sisal, 9½ cents; No. 2 quality Sisal, 8 cents per pound.

Window Glass.—The formation of the National Window Glass Company has been declared to be impossible, as but 1500 of the 1800 required pots signed the contract. Some manufacturers were deterred from signing the contract, it is understood, by the absence of any agreement by the Faulkner Union of workmen to adopt a sliding scale of wages, as, it is said, it had agreed to do. Considerable Glass has been sold ahead for several weeks upon the possibility of the formation of the proposed organization, and the market appears to be stronger as the result of the recent agitation. The view taken of the situation by one manufacturer is to the effect that as the present wage scale is to be continued the high cost of manufacture will be maintained and that this will cause some of the weaker factories to close down because of the comparatively low selling prices. General reports are to the effect that there is sufficient demand to take the Glass being made. Locally trade is quiet and quotations remain unchanged, as follows: First three brackets, single, 90 and 20 per cent. discount; all other sizes, single and double thick, 90 and 10 per cent. discount.

Linseed Oil.—Demand for prompt Oil has been light, while large buyers and crushers are too far apart in their views of prices for contract Oil to result in forward buying. Prices remain unchanged, as follows: Out of town Raw, 42 to 43 cents; City Raw, 44 and 45 cents per gallon; Raw, Calcutta seed, 65 cents per gallon. Boiled Oil, 1 to 2 cents advance over Raw.

Spirits Turpentine.—Demand is for small jobbing lots in a moderate way, there being an absence of large buying. The market has advanced ½ cent during the week under review. New York quotations are as follows, according to quantity; Oil Barrels, 68½ to 69 cents; Machine Made Barrels, 69 to 69½ cents per gallon.

HARDWARE ASSOCIATION IN DELAWARE.

JOHN M. ELLIOTT, with F. G. Elliott, Hardware and Stove merchant, Delmar, Del., directs our attention to the great need of a Hardware association in Delaware patterned after those in successful operation in many other States, especially in the West. Mr. Elliott will be pleased to hear from his brother merchants who feel that they would like to take a part and co-operate in a movement of this sort. It is to be hoped that sufficient encouragement will be forthcoming to warrant a call for an organization meeting at some convenient point.

THE PENNSYLVANIA ASSOCIATION.

(By Telegraph.)

THE fifth annual convention of the Pennsylvania Retail Hardware Dealers' Association is meeting to-day at the Park Hotel, Williamsport. While the majority of delegates have not yet reached the city, a fair attendance is expected. A number of manufacturers have installed exhibits in the hotel parlors. M. L. Corey, secretary of the National Association, will address the convention and conduct the Question Box. Last night the opening reception was held and was a pleasant and informal affair.

TRADE ITEMS.

THE twelfth annual dinner of the St. John Iron and Hardware Association was held at the Union Club, St. John, N. B., on the 24th ult. The occasion was a most enjoyable one, and great credit for its success is due to the Committee of Arrangements, comprising John J. Barry, A. M. Rowan, J. A. McAvity and J. P. Macintyre. The unique menu was in the form of a try square. The 1906 officers of the association are as follows: President, John Keefe; vice-president, W. S. Fisher; secretary-treasurer, John J. Barry. Directors: W. H. Thorne, Thomas McAvity and M. E. Agar.

THE PHILADELPHIA ORNAMENTAL WIRE COMPANY is now installed in its new plant at Camden, N. J., which

has been unroughly equipped with new and improved machinery. The new factory will largely increase the company's capacity. The Philadelphia offices and salesrooms will be located at 525 Commerce street. Hereafter the company will also act as Philadelphia representative of the Trenton Iron Company and will take over all the Wire and Wire Rope stock formerly carried at the Trenton Company's store, 17 North Fourth street, which has been discontinued.

RAILWAY APPLIANCES COMPANY has taken the selling agency for the Elastic Nut manufactured by the National Elastic Nut Company, Milwaukee, Wis., and all inquiries in regard to prices, &c., should be addressed to the Railway Appliances Company, 1175 Old Colony Building, Chicago, or 114 Liberty street, New York.

A. B. WARE, of Atlanta, Ga., has arranged with the Crandall Cutlery Company, Bradford, Pa., to present the company's products to the attention of the trade in the Southern States through his staff of traveling salesmen. The company manufactures "I Must Kut" Razors, Scissors and Shears and Electric Nonrust Pocket Knives.

C. E. KILBOURNE has resigned his position as treasurer and general manager of the Kilbourne Mfg. Company, Troy, N. Y., manufacturer of a large line of Wire Goods and Hardware Specialties. Mr. Kilbourne started this business in Fair Haven, Vt., about nine years ago, and has been its head to the present time.

R. T. GOODE, manufacturers' agent, 83 Lake street, Chicago, who makes a specialty of Iron, Steel and Hardware, is extending his accounts, and would like to receive communications from leading manufacturers in these lines. Mr. Goode has had wide experience, and for ten years sold both the wholesale and retail Hardware trade throughout the West.

E. W. EDWARDS, president and general manager of the Edwards Mfg. Company, maker of sheet metal building material, &c., Cincinnati, Ohio, has commenced a two months' tour of the West, during which he will visit Kansas City, Denver, Colorado Springs, Salt Lake City, San Francisco, Los Angeles and the Grand Canyon of Arizona. The trip will combine business with pleasure, as Mr. Edwards is accompanied by his wife and family.

AT the annual meeting of the Livingston Nail Company, 104 Reade street, New York, Wednesday, January 24, the former officers were re-elected to the several executive positions, as follows: Duncan K. Major, president and treasurer; George B. Olney, vice-president; W. L. Cooper, secretary, and Fred P. Oliver, assistant treasurer.

SIMMONS Hardware Company, St. Louis, Mo., has for some time planned to have a branch at Wichita, Kan., and has for several months been erecting a building suitable for the purpose. Recently the stockholders of the Hockaday Hardware Company sold to E. C. Simmons most of the capital stock and the company is to be continued as the Hockaday Hardware Company until about April 1, when the new building will be finished. A stock similar in variety and assortment to that carried by Simmons Hardware Company in St. Louis and its branches in other cities, where, as will be the case in Wichita, the company does an exclusively jobbing business, will be carried. F. W. Martin remains as an officer of the Hockaday Hardware Company and will also continue in a like capacity in the new organization, which will, at Mr. Hockaday's request, be changed in name. All of the traveling salesmen and employees of the Hockaday Hardware Company have been retained and the business is being carried on to all appearances as though no change had taken place. The Hockaday Hardware Company's stock of Heavy Hardware, &c., has been sold to the Shattuck-George Iron Company.

A recent issue of the *Easton Gazette*, Easton, Md., contains a reference to the Shannahan & Wrightson Hardware Company of that city in which the energy and enterprise which characterize the company's conduct of its large and growing business are given special mention. The business was founded in 1877 by William E. Shannahan, who continues still the senior member of the firm.

NORTH DAKOTA RETAIL HARDWARE ASSOCIATION

THE most enthusiastic and the largest convention in the nine years' history of the North Dakota Retail Hardware Association was held on the 30th and 31st ult. at Grand Forks. More than 200 of the leading Hardware merchants of the State were in attendance and the association received a number of accessions to the membership. Many of the jobbers and manufacturers doing business in the territory were represented by principals and traveling men, and trade samples were conspicuous in hotel lobbies and other available rooms in the neighborhood of the convention hall. The sessions of the association were held at the Commercial Club rooms, quarters that are admirably fitted for gatherings of the kind.

The convention was called to order on Tuesday morning, 30th ult., at 11 o'clock, by President H. F. Emery of Fargo, prayer being offered by the Rev. F. E. R. Miller, pastor of the First Baptist Church. A hearty welcome to Grand Forks was extended by Hon. George E. Duis, Mayor of the city. A feature of the opening session was the presence of Hon. E. Y. Sarles, Governor of North Dakota, who was warmly greeted and made a short address.

The report of C. N. Barnes, who has been the very efficient secretary of the association since its organization nine years ago, showed that there was a membership of 247, only five of this number being in arrears. This is a very large proportion of the Hardware merchants of the State. In connection with the meeting an especially creditable souvenir programme was issued, this having been prepared under the supervision of Mr. Barnes, who is to be congratulated upon it.

The competition of catalogue or mail order houses received a large share of the attention of the convention, many of the speakers who addressed the association referring to the subject at length and the major portion of a long executive session being given up to the consideration of measures for combatting this competition. The proposed parcels post was vigorously frowned upon and also the threatened consolidation of third and fourth class mail matter.

The contest between the Paint Grinders' Association of the United States and the authorities of the State in charge of the enforcement of the pure Paint law passed by the last Legislature received an airing that made it a feature of the convention. C. G. Coffin of Chicago read a paper prepared by the paint men's association, assailing the law in vigorous terms and presenting in detail the arguments of the association. Professor Ladd, the State Commissioner charged with the enforcement of the law, made an address in which he gave some interesting data showing the extent to which many brands of Paints are adulterated with cheap material, and the necessity for a law protecting the public against imposition.

Election of Officers.

The following officers were elected for the ensuing year:

PRESIDENT, H. F. Emery, Fargo.
 FIRST VICE-PRESIDENT, J. S. Cole, Lisbon.
 SECOND VICE-PRESIDENT, J. H. McCollom, Hope.
 THIRD VICE-PRESIDENT, E. L. Garden, Souris.
 SECRETARY, C. N. Barnes, Grand Forks.
 TREASURER, H. T. Helgesen, Milton.
 EXECUTIVE COMMITTEE, E. E. Elliott, Sanborn.
 DELEGATES TO NEXT MEETING OF THE NATIONAL ASSOCIATION: The President, Secretary, Hubert Harrington, Fargo, and G. W. Wolbert, Bismarck.

Resolutions.

The following resolutions were adopted by the convention:

Resolved, That we deem it for the best interests of all people that a national law be enacted which will protect citizens from false advertisements being sent through the mails, as at present anything grossly wrong and deceptive may be printed and sent through the mails, to the serious detriment of the public.

Resolved, That we hereby instruct our secretary to officially notify our Senators and Representatives in Congress that we want no changes made in the present classification of third and

fourth class postal matter. Such changes would be to the detriment of the merchants of the State and increase the present burden of deficit in the Government postal service.

Resolved, Further, that if any changes are made in our postal laws, the 1-cent letter postage rate should be made first, and we want no parcels post bill passed by Congress.

Resolved, That a copy of the above resolutions be sent to each of our Senators and Congressmen.

Next Meeting at Minot.

Heretofore the sessions of the association have been held alternately at Grand Forks and Fargo, both in the extreme eastern part of the State. It was decided to hold the next annual meeting at Minot, a comparatively new commercial center, in the northwestern corner of the State. This decision was made subject to the decision of the Implement Dealers' Association to meet at the same place.

Local Associations.

W. C. Webber of Rochester, Minn., made an address on the advantages of organization. Mr. Webber is secre-



H. F. EMERY.

tary of the Olmstead County (in which Rochester is located) Retail Dealers' Association, an organization which has done effective work for its members. Mr. Webber stated that there had been a wide inquiry as to the methods adopted by his association, and over 200 other counties had since been organized on its plans. County and local associations, the speaker said, can help the retailer in many ways outside of the limit of the possibilities of a State association. The larger organization, while it is doing a grand work, can hardly help the individual members directly and the individual member is likely to feel that his identity is lost. With county and local organizations there is an opportunity for each one to do something and for each to have responsibility.

The speaker mentioned various ways in which the members might help each other—credit and collection departments, for instance. He believed that in a few years the State associations would become federations of the county associations. By its systematic campaign of education the Olmstead County Association had been able to cut down the business of the mail order houses in that section fully 70 per cent.

Scientific Salesmanship.

Alex. W. Crozier of Minneapolis, Minn., discussed "Scientific Salesmanship" in a paper which attracted much attention. Salesmanship, the speaker said, is the art of selling the article to be sold at a profit. A great many merchants seem to think that success consisted in being able to handle a large volume of business and to

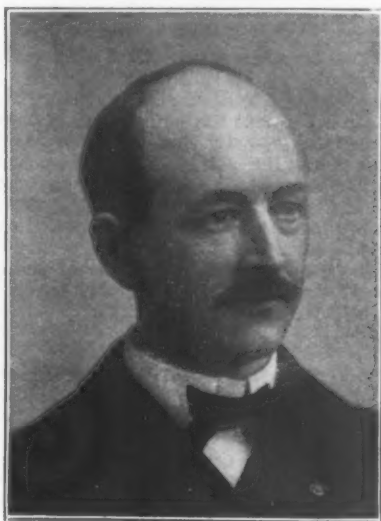
get customers away from competitors, rather than to be able to show a profit on the right side of the ledger at the end of the year. The science of successful salesmanship is organized knowledge of the art of selling.

Three mental steps must be taken in every sale. 1. Secure attention. 2. Inspire confidence. 3. Create a desire to purchase the article you have for sale at a profit. Eminence in the profession of successful salesmanship can only be obtained by a mastery of the situation. Many do not succeed largely because they do not attempt large things.

Gasoline and Refined Oils.

A very instructive address was that of W. J. Holton of St. Paul, Minn., on "Gasoline and Refined Oils," from the standpoint of an expert. North Dakota merchants, he said, appeared to think a gasoline with a gravity test of 72 to 76 was the best adapted to the requirements of their trade, while as a matter of fact 68 to 70 gasoline is being generally used by the manufacturers of gasoline engines, who have closely investigated the comparative merits of gasoline of the different gravity tests. From the 68 gasoline more power could be had than with the more volatile 72 to 76.

Some merchants did not realize the importance of keeping their gasoline tanks and reservoirs clean. The



C. N. BARNES.

same measure or funnel should not be used for Gasoline as for kerosene. A leaky gasoline tank may allow large quantities of deadly vapor to escape, and the fact not be fully realized until some one goes down to the basement or wherever the vapor has settled, with a light or a match, and then something happens. Gasoline should not be kept in the basement. Keep it outdoors in a separate building, and keep it well covered and protected. Gasoline will not explode except under two conditions—either when it is mixed with six parts of air or when it is sealed up and heated to the point of ignition. Gasoline stoves scarcely ever explode. In fact, the speaker said, never under ordinary circumstances. It is the gasoline which has overflowed or leaked out that catches fire and burns, but does not explode, that makes the trouble.

Refined oil of a specific gravity of 42 to 43, he added, was better adapted to commercial use than that of 46 degrees. If merchants would handle good burners much of their trouble and complaints of poor oil would cease. The burner should have an air tube besides the wick tube in order to get good results.

M. L. Corey's Address.

One of the most interesting addresses of the convention was that of M. L. Corey, secretary of the National Association, in the course of which many features of the work of the national organization were covered. The speaker urged hearty co-operation between the State and National bodies. The speaker urged the importance

of sustaining the mutual insurance companies and gave some statistics showing the benefits of these.

Mr. Corey also devoted considerable attention to the catalogue and mail order house competition. In solving this problem, he said, the jobbers and retail dealers stood side by side. Considerable is being done along the lines of a campaign of education. About 70 per cent. of the manufacturers of Hardware have discontinued selling to the catalogue houses. Fifteen per cent. more have refused to sell to them unless they can control the price to consumers and place it on the same basis as that of the regular dealers, so that the catalogue houses are finding it more and more difficult to secure goods. Some of the latest catalogues have eliminated some of the standard lines of goods, obviously because they can no longer obtain the goods. The speaker urged the dealers to meet the competition of the mail order houses by employing the methods of the latter, so far as they were correct methods. He urged liberal advertising and said the local newspapers were the best channels for retail dealers.

In the campaign of education, he said, it was often an easy matter to demonstrate the difference in quality between the lines of goods sold by the catalogue houses and those handled by the regular dealers. Mr. Corey suggested that the dealers had themselves to blame to some extent for trade lost to the mail order houses. He suggested some things that might be done to improve conditions in this respect.

Another topic discussed by the national secretary was the Parcels Post bill. The secretary urged the dealers to write personal letters to Senators and Congressmen protesting against the Parcels Post bill and also against consolidating third and fourth class matter.

Paints as a Hardware Line.

V. W. Hartman of St. Paul, Minn., made an address on "Paints as a Line to Be Carried by Hardware Dealers." Mr. Hartman said in part that the Hardware store was the natural and correct place for Paints to be found by the consumer. The man building his home comes to the Hardwareman for his Nails, Door and Window Fittings and the Hardware necessary in the construction of his home. The progressive dealer fills himself full of Paint facts, and he gets his clerk full of Paint, too. You cannot have too much enthusiasm about your business. The more you have the more you will give to your clerks; the more you will impress your customers that you believe in the worth of the goods you sell, and this is half the battle of selling anything.

Banquet.

On Tuesday evening the members and visitors to the number of about 250 enjoyed a banquet and social session in the large banquet hall of the Commercial Club. H. F. Emery, president of the association, officiated as master of ceremonies. The menu was an elaborate one and there was feasting and music and mirth until the small hours of the morning.

President's Annual Address.

In his able and felicitous annual address Mr. Emery referred to North Dakota as a "one crop country," and as such there were a good many anxieties for its business men. In early spring we begin to wonder if we are to be favored with weather for seeding. Then in May we begin to worry about the possibility of the crops being flooded out with the June rains. In July it is anxiety about a possible damage from drought. Early in August we wait with more or less anxiety for signs of the dreaded hail storm, which may wipe off the face of the earth the crops of an entire township, or even of a county. Then comes the worry and anxiety incident to harvesting and threshing. Later it is a question of getting the grain marketed, and the collection season adds a few gray hairs.

The president spoke of the help the association had been to its members and expressed his gratification at seeing so many of the charter members present. He extended a cordial greeting to the numerous new members, and expressed the hope that they might find the association beneficial to them in many ways.

Secretary's Annual Report.

The annual report of C. N. Barnes, Grand Forks, secretary, was an interesting document and touched on many important matters connected with association work. We make the following extracts from it:

It is with considerable gratification that I present at this time the ninth report that I have been privileged to submit to you, as we have much to feel encouraged over in the forward stride this association has made during the past 12 months.

GRIEVANCES.

On December 21 last I addressed a letter to every member of this association asking them to file with us any complaint they had, so a proper investigation could be made and a report presented at this meeting. We have had but one response from these letters, which leads us to believe that the Hardware business throughout the State is in a very satisfactory condition, inasmuch as our membership is larger than ever before and with fewer complaints from them.

MEMBERSHIP.

We have to-day 247 members, which is the largest number this association has ever enjoyed, and only five of this number are in arrears. Considering the number of Hardware dealers in the State to draw from, this should be very encouraging.

To secure this increased membership has necessitated a great deal of correspondence and in consequence quite an expenditure for postage. On account of the very large area covered by North Dakota and the comparatively small number of Hardware dealers in the State, it has



H. T. HELGESEN.

never been considered feasible to adopt any other method of securing members than by correspondence, but I consider this a very opportune time to discuss other practicable ways to increase our membership and would be pleased to have the topic taken up while we are together.

SHIPPING TAGS FOR DIRECT SHIPMENTS.

I am in hope that our members have complied with the resolution adopted at our last annual meeting which requests them to furnish their own shipping tags to jobbers and others when placing orders with them for goods to go direct on their account. By carrying out the spirit of this resolution it would aid very materially in our work.

DIRECTORY OF HARDWARE DEALERS.

One of the most difficult features of the work in this office is to secure a correct directory of the Hardware dealers in the State. I have tried every way I can conceive of to secure it, but as yet I have not made the success desired in its compiling. I am led to believe that the only way to collect an absolutely correct list of the Hardware merchants in the State is by their co-operation.

The list that is printed in our souvenir programme this year is reasonably correct, but there are many names that should be included in it that I have been unable to secure and there are others there that in all probability should not be. Before the adjournment of this meeting I will appreciate exceedingly having my attention called to any omissions or errors found in it, as it is very important that a correct directory should be secured of the Hardware merchants of North Dakota if we expect to progress.

THE PURE PAINT LAW.

Nothing has come before the association in years that has attracted so much interest and discussion as the contest between the State authorities and the Paint Grinders' Association of the United States over the enforcement of the Pure Paint law passed by the last Legislature. Both sides of the controversy were presented on Tuesday afternoon, G. W. Coffin, of Chicago, reading a paper prepared by the Paint Grinders' Association, in part as follows:

From the Maker's Standpoint.

The Legislature of your State at its last session, after a few hours' consideration, passed an act which undertakes to prescribe the way in which Mixed Paint shall be made. The committee to whom the bill was referred and upon whose report it was passed did not contain any member who professed to know anything of the complex science of Paint making; nor was there probably among the members of the Legislature a single individual who understood the scientific principles underlying the manufacture of a good Paint; nor, so far as can be learned, did the Legislature or the committee undertake to get light upon this difficult subject from any one with practical experience in the manufacture of Paint. And yet this Legislature, with an utter lack of understanding of the entire subject upon which it was about to legislate, assumed in a few hours to do that which the most enlightened and progressive Paint manufacturers have striven for fifty years to accomplish—that is, to determine how the best Paint could be made.

SUBSTANCE OF THE ACT.

In substance the act provides that a Mixed Paint manufacturer who makes his Paint out of linseed oil, pure carbonate of lead, oxide of zinc, turpentine, Japan dryer and pure colors, can sell the same in the State of North Dakota without any restriction or penalty whatsoever; on the other hand the Mixed Paint manufacturer who uses any other than the above mentioned ingredients is guilty of a misdemeanor and punishable with a fine and imprisonment unless he puts a label upon the can showing the true percentage of each and every ingredient other than those designated. The title of the act is "An act to prevent the adulteration of and deception in the sale of White Lead and Mixed Paints."

THE NECESSARY INFERENCE

which the people of North Dakota must draw from the statute is that in the opinion of the Legislature the enumerated ingredients are the best ingredients and hence a Paint made from these ingredients alone need not be labeled, but that if any other ingredient is used it is an adulterant, and the ingredient and percentage used must show on the label in order to prevent deception. As the great majority of the purchasers and users of Paint are not possessed of any

TECHNICAL KNOWLEDGE

on the subject they must naturally come to the conclusion that when they see a can of Paint without a label showing the ingredients it is the best Paint because the Legislature has said that it is. But if they see a label on the can bearing the formula they necessarily imply that it is an adulterated Paint because the Legislature has branded it with a label. In other words, the Legislature has made the label a badge of inferiority and adulteration.

A just law should protect alike the rights of the manufacturer, the dealer and the consumer, and to be equitable, reasonable and enforceable its provisions should be such that it will not, as is the case with the present law, practically bar out a large variety of Paints.

The opinion of manufacturers of Mixed Paint who have given this subject exhaustive thought and experiment, and who have arrived at results based on practical experience, and not on theory, should be given much weight in the determination of the value of a combination product as against any single or dual pigment base.

TO COMPLY WITH THE STATUTE

imposes upon the manufacturer the great trouble and the expense of analyzing each and every batch of Mixed Paint and printing and attaching to the can a different label for each lot which is shipped into North Dakota. We claim there is no fair reason for distinguishing between the Paint manufacturer who uses only the statutory ingredients and the manufacturer who uses other ingredients instead of or in addition to the ingredients sanctioned by the statute.

The whole matter therefore resolves itself into a consideration of the question of the value of a Mixed Paint made from the statutory pigments alone, as compared with a Mixed Paint made by the use of the prescribed ingredients, together with other ingredients not specified in the statute, or in comparison with a Paint made without the use of the statutory ingredients at all.

TESTING THE VALIDITY OF THE STATUTE.

We cannot better illustrate the points which it is desired to bring to your attention than is done in the complaint recently filed by many of the leading Paint manufacturers of the country in the suit which they have brought to test the validity of the statute. That suit was brought by Heath & Milligan Mfg. Company, the Sherwin-Williams Company, John W. Masury & Son, Acme White Lead & Color Works, Detroit White Lead Works, Devoe & Reynolds Company, John Lucas & Co. and Harrison Brothers & Co. It is a fact that many others would have joined, but it was considered sufficient if the above named firms brought the suit, as they represent the leading Mixed Paint manufacturers of the country who are doing business at this time in this State.

THEY ALL STAND SPONSOR

for the proposition set forth clearly in the complaint that a much better Paint can be made by the use of certain ingredients other than or in addition to those mentioned in the statute, and that, in fact, some kinds and grades of Paint, for which there is a great demand and which are in daily use, cannot be made at all if only the ingredients prescribed by the statute are used.

THEIR CONTENTIONS ARE SUPPORTED

by the evidence of distinguished chemists who have testified or who are prepared to testify in support of the statements made in the complaint. We are going to follow closely the complaint in order that you may see the exact nature of the objections raised by the Paint manufacturers to the statute in question.

THE MANUFACTURERS COMPLAIN

that the act in specifying only Linseed Oil and Turpentine as ingredients proper to be used as thinning vehicles in Mixed Paints and excluding Varnish and thereby inferentially branding it as an adulterant, is unreasonable.

Furthermore, they maintain that "pure" Carbonate of Lead, which is one of the ingredients of Mixed Paint specified in the act, is an article which cannot be used for the purpose of manufacturing Paint; that the carbonate of lead which is commonly used and has been used from time immemorial in the manufacture of Paint, even of the very highest grades, is not "pure" carbonate of lead, but contains approximately 20 to 30 per cent. of other ingredients; and they further insist that most of the Mixed Paints for which there is a demand cannot be produced by using exclusively the ingredients specified in the act, other than carbonate of lead. They therefore charge that the act in enumerating "pure" carbonate of lead among the specified ingredients of Mixed Paints and prohibiting, as a crime, the use of the commonly used commercial carbonate of lead without specifying on a label the quantity or amount of each of its ingredients, is unreasonable and void.

THE MANUFACTURERS KNOW

that while this act was intended to be a police regulation for the prevention of fraud, its provisions are such that it has no tendency to accomplish this end; that this act, by failing to specify the maximum or minimum of the proportionate amount of the ingredients specified in the act which are to be or may be used in Mixed Paint, permits of the manufacture and sale, without any label, of Mixed Paint containing these ingredients in such proportions as to make it absolutely inefficient and useless and a fraud upon the purchaser; that by holding up to the prejudice of dealers in and users of Mixed Paint, such Mixed Paints as contain ingredients other than those specified in the act, the act renders unsalable or less salable a large number of brands of Mixed Paints containing ingredients other than those specified in the act, which Mixed Paints are far more efficient for certain purposes than any Mixed Paints which can be made by using only the ingredients specified in the act; that the act, therefore, has the direct tendency in many instances to encourage the people of the State of North Dakota to give to inferior brands of Mixed Paint a preference over superior brands of Mixed Paint, in the mistaken belief engendered by the act that the poorer article is better than the better article.

As a matter of fact, we believe that what you, as dealers, and the citizens of your State, as consumers, are looking for in a Paint is not a product made to chemically conform to the ideas of persons not practical in the intricacies of Paint making, but a Paint that when used properly will give the maximum service, viz: protect the surface over which it is applied satisfactorily for the greatest length of time, meanwhile preserving and beautifying such a surface.

MAIL ORDER HOUSES EXEMPT.

Furthermore, we wish to call your especial attention to the fact that the act only covers those who manufacture for sale or expose for sale within the State and that it necessarily does not cover the mail order houses who ship large quantities of Mixed Paint into the State of

North Dakota, because they do not make any sales within the State nor expose their Paints for sale within the State.

As we well know, the mail order people ship their Paints direct from their base of supply to the consumer in original packages and, as a consequence, are protected by our interstate commerce laws and are not amenable to your State laws.

It does not seem that any State law is legal which so clearly and effectually legislates against the self-supporting merchants in the State, who have not only done so much in the past, but are continually putting forth their best efforts for the improvement and the prosperity of the State itself, as is evidenced by the work being done by your own organization. It seems unjust, too, from the standpoint of the reputable Paint manufacturers, some of whom have been in the business for over half a century, and during that time have devoted their best energies, in fact have made it their life's work, to manufacture a Paint which would give the best results, and who, from their knowledge of the requirements of a results producing Paint, find it advisable and necessary to employ ingredients other than those sanctioned by this statute. Still, according to the terms of this law, these legitimate, honest manufacturers must stigmatize and brand their



W. R. MCINTOSH.

Paints as adulterations in the eyes of the consuming public to comply with the law.

In Defense of the Statute.

Prof. E. F. Ladd said that he would not claim that the North Dakota law was perfect. The Sherman antitrust law, he said, was not perfect, but it was a beginning in the right direction and there is time yet to amend the North Dakota law on points where it may be improved.

Professor Ladd continued: I am not here to-day as a Paint expert to consider the technical questions involved in the manufacture and use of Paints, or of the variety of products which may be usefully employed in the preparation of certain Paints for technical or other special purposes.

A FAIR KNOWLEDGE DEMANDED.

I am not here to defend the North Dakota Paint law as the most perfect law that can be drafted, but rather to point out to you that it is a step in the direction of demanding for the consumer a fair knowledge of the substances which he purchases. It is true probably that the law will need to be strengthened and that it will become necessary to bring under this law certain products which may not be included. I maintain, however, at the outset that 75 to 85 per cent. of the total Paints employed in this State come within the provisions of this act and by further legislative enactment the others, which are largely specialties, may be brought within its scope.

In order to set myself right at the start, let me say I am a firm believer in ready prepared or Mixed Paints. What criticisms I have to make are aimed at abuses common to all classes of Paints and, known to all intelligent men. Ready Prepared Paints, properly made, are the best of all Paints and the most economical for the use of the consumer.

IN HARMONY WITH THE FOOD AND DRUG LAWS.

That there are Paints and Paints is a well-known fact, that I need not tell you. That some of these Paints are not what they are represented to be, may be clearly shown by the literature which has already been published by the experiment station. The North Dakota Paint law is in perfect harmony with the food, drug and formaldehyde laws of this State, which have been recognized by authorities throughout the country as being as nearly perfect as any laws now upon the statute books touching these subjects.

LET THE LABEL TELL THE TRUTH.

The North Dakota paint law simply says, "Let the label tell the truth, the whole truth and nothing but the truth." Why should honest Paint manufacturers dread such information being placed before the public? An honest Paint manufacturer should welcome a law of this kind in order that the producers of spurious products may be driven from the market, and thus remove them from competition with the better grade products, which have a legitimate place among the Mixed Paints.

The question may fairly be asked: What is a pure Paint? The answer given by the manufacturers will, I fear, depend largely upon the character of the product produced by the manufacturer and the constituent which he may desire to employ in the production of his Paints.

Professor Ladd then described at length the composition of Paint, and claimed that if other than the usual or proper ingredients were used the purchaser was entitled to know of such substitution. He continued:

That there are some Paints upon the market which are not desirable products cannot be denied, and the people have as much right to know which Paints are what they are represented to be as they have to know that commercial fertilizers are what their manufacturers claim for them. Let us not forget, however, that those Paints which have been upon the market and have stood the tests of 25 years, even though they do contain other pigments than white lead and zinc oxide, are not to be condemned without a justifiable reason. That they might be improved may be true, but that they are worthless, or that they are not worth what may be charged for them, is not for the speaker to maintain. When, however, they introduce constituents the presence of which all authorities are agreed in condemning, whether it be free resin, water, alkali or inert material, then the public has a right to demand that this fact be stated clearly upon the label and in the literature which is distributed by the manufacturer.

A. C. Bartlett's Address.

The feature of the Wednesday morning session was a notable address on "Business Success," by A. C. Bartlett, president of Hibbard, Spencer, Bartlett & Co., of Chicago, which attracted much interest. Mr. Bartlett said in part:

The evolution of trade has been as marked and rapid as has been the growth and development of this country. New conditions have demanded, nay, extorted, new methods. Merchants have as a rule reluctantly acknowledged the innovations which set at naught their preconceived ideas of the manner in which legitimate business should be transacted. This statement is applicable alike to the city and country dealer, to the wholesaler and retailer. The "good old days," about which we elderly men love to talk, have passed away, and the new era finds us wondering if profitable merchandizing will not eventually be numbered among the lost arts.

THE JOBBER'S REMINISCENCES

carry him back to the time when his customers visited his office and sample room twice each year, made selections and purchases for the six months to follow, and in the interim between visits sent occasional orders by mail to keep the assortment complete. The heads of wholesale houses and the proprietors of retail stores enjoyed a personal acquaintance, which, as a rule, ripened into lasting friendship. To-day the jobber rarely knows his customers except by name, and the pleasant social features of merchandizing are simply memories of the past.

He is represented by traveling salesmen, who scour the country for trade; by territorial managers, who look after the filling of orders, and by credit departments, which keep in touch with the financial and moral responsibility of the men who distribute the goods to the consumers. Commercial business has become more and more mechanical and necessarily, therefore, less and less sentimental. It has been reduced from the plane of sociability and good fellowship between principals to that of a comparatively inflexible system.

I take it for granted that the older retail merchants in common with the jobbers deplore this change from personal intercourse to long range transactions, however

much the visits of well informed and genial representatives may lighten the labor incident to the making of purchases. The change, too, subjects the retailer to the temptation to mix his stock, to its detriment and to his loss of profit. The merchant who buys goods (outside the staple lines) of any good fellow who comes along is bound to have a heterogeneous assortment that is neither attractive nor conducive to fair profits; neither can he have a strong hold upon his customers.

ADHERENCE TO THE SAME BRANDS.

The jobber is, generally speaking, compelled to adhere year after year to the same manufacture and the same brands of goods if his original selections have been wise. The jobbing house which should, for example, solicit your business on Steel Goods this year for Batcheller, next for Geneva, the third for Ashtabula, and the fourth for Iowa Farming Tool Company's, would make little impression upon your mind with whatever it might offer the fifth year. It goes without question that this is true, to an extent, with the offerings to consumers by the retailer. If a carpenter buys a good Chisel he wants the same brand when he makes his next purchase.

Further than this, every good Tool sold a mechanic is a first-class advertisement for the dealer to every other mechanic with whom the former associates, and the advertisement costs the latter neither money nor friends.



A. C. BARTLETT.

The merchant who buys his Locks and other Builders' Hardware here, there and elsewhere never fitted up a new house to his own satisfaction or the satisfaction of his customer, and the odds and ends of a broken assortment, to be sold at a liberal discount, materially lessen his profits.

MY OWN OBSERVATION

leads me to conclude that one element of business success lies in the selection of as high quality of goods for permanent lines as the local trade will consume and adhering to these lines, with their distinctive brands, under all circumstances. The same rule applies to the cheaper or competing goods, but to a more limited extent.

If you are doing business with a reputable and reliable jobber it is a false notion that your goods, which I have designated as belonging to permanent lines, will cost, month in and month out, year in and year out, more money than if purchased indiscriminately of the salesmen who offer special bargains, for the reputable and reliable jobber could not afford to allow such a condition of affairs to exist.

UNDER THE NEW BUSINESS REGIME

comes the better, more attractive, display of the wares offered for sale. The junk shop appearance of a Hardware store is relegated to the past. There is certainly no good reason why a Hardware stock should look like the after effects of a second-hand cyclone. No man to-day can hope for the greatest success who does business in a tumble-down building, behind show windows so thickly covered with dust that they admit darkness rather than light, thus intensifying the inner gloom, and who fishes his Maydole Hammers out of a Nail keg.

ANOTHER MARKED FEATURE

of the evolution of trade is the variety of goods which has fallen to the lot of a Hardware merchant, wholesale or retail, to handle. A year or two before my senior part-

ner, Mr. Hibbard, died, he and I one day were in the Cutlery department when the men were filling a new show case with Cut Glassware. He called me across the room and said, "Is it possible, Mr. Bartlett, that we have come down to this?"

The retail assortment is no longer confined to Stoves, Nails, Tools, Builders' Hardware and the like, but very frequently includes Harness, Paints, Yankee Notions, Electrical Fittings, Oilcloth and a large variety of house furnishing goods.

UNDER ONE ROOF.

There seems to be a growing desire upon the part of consumers as well as upon the part of retail merchants to purchase their goods as far as possible under one roof, for by so doing (other things being equal) their purchases are made as cheaply, with less inconvenience; they secure more prompt deliveries, and in the case of the merchant, less expense in transportation. If a retail merchant desires to achieve the greatest possible financial success he must keep in the van of the procession, which is moving forward under the impulse of new ideas. He must be early in the field with new goods, prompt to meet the requirements for increased variety, fertile in expedients to win trade, and tasteful in the display of what he desires to sell, more especially of the profitable lines.

THE CATALOGUE HOUSE.

Another comparatively new feature in the commercial world is the advent of the catalogue house, the bane of the retailer in every city, village and hamlet throughout the country. The output of these houses is so large that their capital and expenses are small compared with the aggregate capital and expenses of the number of retail stores, which in combination sell an equal quantity of goods. This condition, together with the variety of articles which these houses carry, and from which the consumer may select, and the willing prepayment in cash by the country buyer, renders the competition fierce and frequently unprofitable.

These houses, which were originally started in a small way, were in their incipency considered harmless and legitimate, and their wants were as freely supplied by the jobbers as were the wants of other dealers. As they grew in size and strength they became valuable customers to jobbers and manufacturers and, I regret to say, were not cut off by the former or by any of the latter until long after they had become a menace to the merchants whose business it was to supply the consumers in their respective localities.

This lack of promptness on the part of jobbers in declining to sell to catalogue houses was due in part to the human—perhaps greedy—desire to sell goods, but more especially to a lack of realization upon their part of the real damage which their customers were sustaining at the hands of catalogue competitors. I question whether retailers themselves at the outset had any just comprehension of the evil which the principle itself engendered.

The jobbers are making strenuous efforts to convince all manufacturers that they should decline to make shipments not only to catalogue houses, but to any dealers who will supply those houses. More than this, the jobbers are curtailing, so far as possible, their purchases from those manufacturers who have not joined this movement.

CO-OPERATION.

It seems to me that your business success depends in part upon your earnest, constant and unceasing co-operation with the jobbers and with such manufacturers as have pledged themselves to withhold their product from the catalogue houses. Are you doing this? Are the members of this association discriminating in favor of those manufactures and brands of goods which are not sold through catalogue houses?

But you must go farther than this if you wish to retain the business to which you are justly entitled. I say justly entitled advisedly, because at cost of time, labor and money you carry stocks of goods convenient to the homes of your customers; you supply those customers on credit, and should have a call on their cash purchases, and you would unquestionably supply their wants through the year at as low aggregate cost to them as they secure by buying away from home. These foreign purchases can be attributed, in part at least, to an innate vanity in buying at what the consumer is led to believe are headquarters.

EXTENSION OF INFLUENCE.

Further than this, I believe that your larger business success is somewhat dependent upon your extending your influence to other branches of trade than the Hardware. Suppose the enterprising gentlemen who have formed this association and constitute its membership should, each in his own town, awaken the interest of his fellow merchants in all lines of business, and these merchants should inform their jobbers that in future they preferred not to sell goods which were handled by catalogue houses; and if the Hardware dealers in other States should pur-

sue the same course in awakening interest and enthusiasm among their fellow merchants, how long would it be before catalogues would grow smaller and smaller in size and less and less in number?

A large jobber of groceries in Chicago recently said that so much pressure was being brought to bear upon his house by its customers that the firm was seriously considering the advisability of following the example set by the Hardware jobbers.

GO AFTER BUSINESS.

In the meantime what is to be done to conserve the business and insure its profits? There can be but one answer: Adopt methods that will meet and counteract the influences which are undermining your trade. Do not wait for customers to drift into your stores, but go for their business by judicious advertising, by personal letters, by distribution of Hardware literature that will attract them to your showrooms, by making special inducements for cash on delivery—not cash sent with the order.

Some of our customers, more especially in Ohio, have issued circular letters to the farmers, mechanics and others in their vicinity offering to sell goods for cash at as low prices as the same qualities can be delivered from the catalogue houses, and I understand the venture has been a successful one. It is surprising how comparatively few goods are really demanded on lists of low prices and how many outside those advertised are sold at full values because of these advertisements.

WITH A VIEW TO ASSISTING OUR CUSTOMERS

to bring their goods to the notice of consumers somewhat after the plan adopted by catalogue houses, we recently issued what was called a "Christmas Herald," and distributed it in round lots among the trade, and from which we have heard flattering reports. One of our people who attended the convention held at Mitchell, S. D., two weeks ago was told (and I think the statement was publicly made to the association) that this little book had rendered great service in combatting the catalogue houses. We shall issue a larger one the coming spring, and I presume other jobbers will adopt corresponding means for the assistance of the retailers.

BETTER MEN, BETTER CONDITIONS.

But business success does not mean the making of money only; it means the making of better men and the improving of conditions in the community. Every merchant who has a handsome show window, a well kept and orderly stock of goods, who adopts and pursues the cleanest and best business methods, not only develops himself, but exerts an influence which makes for higher and better things in the town in which he lives. Not only does his example lead his neighbors to make improvements, but he is laying a section of the foundation for the education and mental development of the rising generation. Try as we may to adjust the results of our labors to ourselves, we know at heart that we are working for our own and our neighbors' children. We are in reality laboring with the hope that our progeny may suffer fewer hardships and receive greater educational advantages than were accorded to their parents, and we lay the main stress on the educational advantages. The world is coming to know more and more certainly that knowledge is power; that knowledge means a wider vision, a broader usefulness, and, therefore, greater real happiness. Men are learning that even the higher education is not necessarily wasted upon business men, whether they live in the country or in the city.

TRADE AND COMMERCE

can boast of no aristocratic blue blood of idleness, but of an ancient and honorable record for usefulness. There are no shadows upon their fair fame except those cast by the misdirection, treachery, greed or dishonesty of their representatives. The principles upon which they were founded are universally pronounced correct, and there is no indication of inherent weakness in the past which marks them as unworthy of adoption by the intelligence of the present day.

The intercourse of nations through the medium of commerce, the acquirement of knowledge, the growth of civilization, the interchange of ideas, the development of natural resources, are as certainly promoted by traffic to-day as they were a thousand years ago. Greater facilities have produced greater results; new inventions and discoveries have broadened the fields, and a better civilization has opened new channels of usefulness.

TRADE IS THE GREAT PEACEMAKER.

The business transactions resulting from the manufacturing of New England, the producing of cotton in the Atlantic and Gulf States, the mining of iron ore in Tennessee, the shipments of corn, pork and merchandise from the Northwest and the raising of sugar cane in Louisiana, have done more toward adjusting the sectional differences which have existed between the North and

the South of our own country since the Civil War than the presence of Government officials, edicts from Washington, political combinations, and, may I add, the influence of the church, combined. The alliances formed by trade become almost fraternal. State and National associations of merchants stand for something more than mere money making.

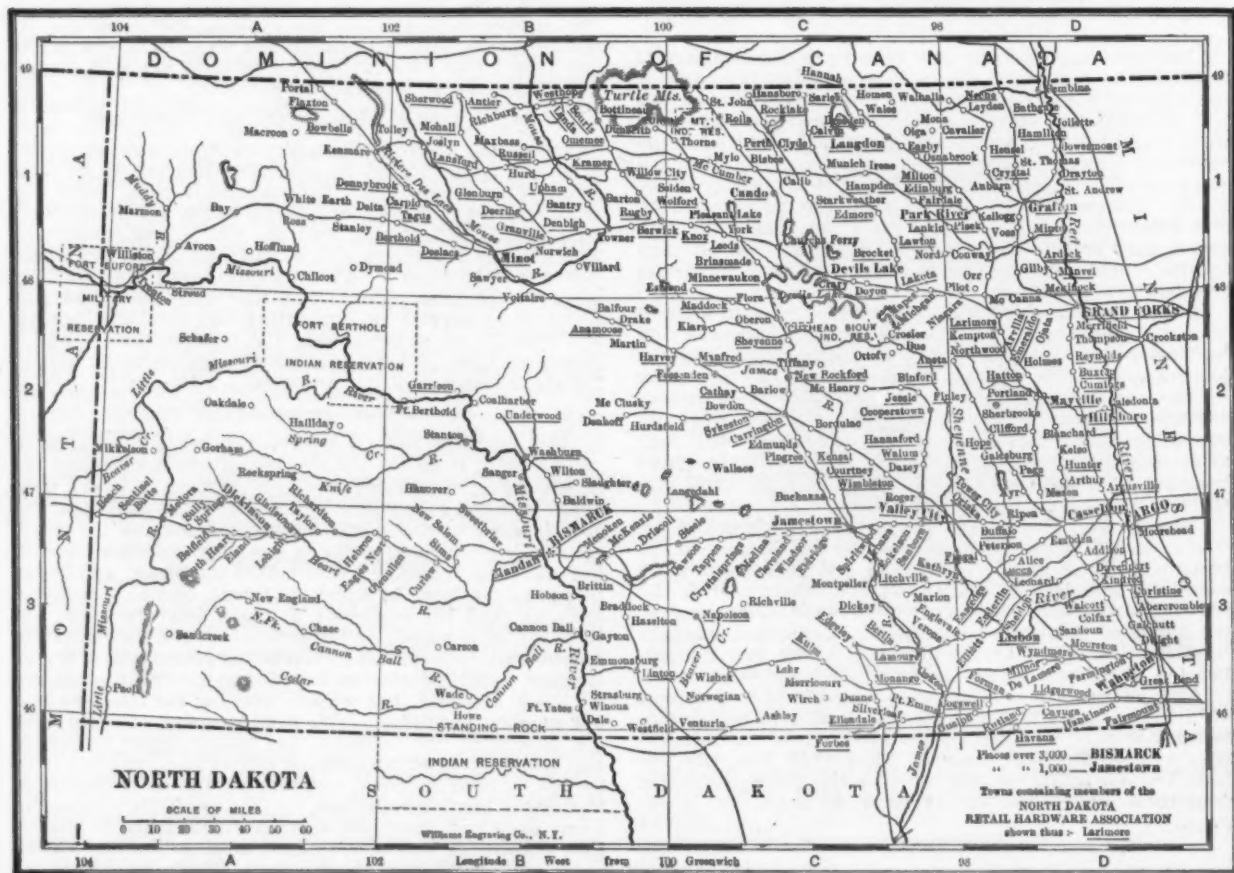
COMMON CAUSE AND COMMON INTERESTS
are binding articles in the unwritten pledges of friendship and good will. Trade prospers with general prosperity and hence rejoices in the thrift and good fortune of all classes of society. It languishes with depression and adversity in other branches of industry, and therefore sympathizes in the losses and failures which are not directly its own. Its interests are interwoven with the interests of the farm, the factory, the workshop and the office. It belongs to the great brotherhood of honest industries, in which there is no gradation of rank except that created by the diversity of mental gifts and training of its individual members.

TRADE IS A SCHOOL OF BENEVOLENCE
in which its pupils should be fitted for that practice of philanthropy in which their business prosperity will en-

There are bankers in Dakota who are as successful as the bankers of London. There are merchants in Dakota who are as successful as merchants in New York or Chicago. Can we not reach a conclusion of the whole matter by saying that business success, wherever that business is conducted, is achieved when a merchant has demonstrated a thorough and exact knowledge of his particular branch; an ability to expand his trade to the utmost limits of possibility, and to secure all the profits to which that trade is justly entitled, and to make his business a worthy example to his fellow citizens and its results a blessing to the community in which he lives?

Hardware Association Map.

The map of North Dakota, here reproduced, will afford the reader, especially the nonresident, an intelligent idea of the distribution and location of the membership, topographically, to date, of the North Dakota Retail Hardware Association. It will be seen that the cities and towns containing members are underscored, for example, as Larimore. Places having 3000 and more population, based on the 1900 census, are in capitals, as BISMARCK, and those containing over 1000 and up to



Hardware Association Map of North Dakota.

able them to engage. Each golden harvest of success may be utilized in giving growth and adding to the vigor of useful enterprises, to insuring prosperity and happiness to the otherwise poor and unhappy of God's children.

These claims for the betterment of mankind and the world at large are not the exclusive property of the great merchants or the great manufacturers. The men who are in the eye of the public on account of their colossal fortunes, their munificent gifts, or their breadth of vision, are no stronger or better men, nor are they doing more good in their respective spheres, than are the thousands whose environments and advantages have been less favorable for reaching larger results. We are all to an extent creatures of circumstance. The merchant in the small hamlet who has improved to the fullest extent the material which his location afforded has achieved relatively

AS GREAT A SUCCESS

as has his fellow merchant in the large city, who is made more conspicuous only because of his superior advantages. Success, like wealth, is a matter of comparison. As the unthinking world counts success and failure, large opportunity means great success or great failure; smaller opportunity means smaller success or smaller failure. The true estimate is reached by a computation which includes all elements entering into the career whose results are being computed.

3000 in a full faced type, while smaller towns are designated in ordinary type.

Obviously a census nearly six years old does not correctly reflect current conditions in a State so favorable to agriculture as North Dakota, which in 1900 was credited with a population of 319,146, which was an increase of 74.7 per cent. over 1890 and nearly 800 per cent. over the census of 1880.

As is indicated by the map, the most thickly settled portion of the State is the eastern. New settlements, however, are continually springing up in the western portion as railroad construction opens up the country. Heretofore the annual conventions have been held in two cities, Grand Forks and Fargo, on the Red River, but it is proposed to hold the next annual meeting at Minot, in the northwestern part of the State, at the junction of the Great Northern and Minneapolis, St. Paul & Sault Ste. Marie railroads. This will doubtless be appreciated by the members located in that section of the State, while it will also doubtless be effective in securing accessions to the membership, which even now is very creditable and well representative of the Hardware interests of the State.

CONVENTION NOTES.

R. A. Kirk, of Farwell, Ozmun, Kirk & Co., St. Paul, Minn., read an interesting paper on what the jobbers are doing to assist retail merchants in their struggle with the competition of the catalogue houses. His remarks were listened to with close attention and appreciation.

E. L. Miller, editor of the *Duluth Trade News*, Duluth, Minn., delivered one of the most entertaining addresses of the meeting, with "Keeping in Touch" as his topic.

Eighteen stove men were at the convention, and most of them had samples of range and heating stoves of many patterns.

It was determined to make the next a three-day convention, as it was found necessary to curtail the consideration and discussion of many matters at the two-day meeting just held, owing to lack of time.

Membership of the North Dakota Retail Hardware Association February 1, 1906.

ABERCROMBIE. E. M. Hackett.	CUMINGS. Bemis & Wilsie.	GRANVILLE. Granville Hardware Store, W. F. Clarke & Co.	MONANGE. D. J. McDonald.
ALICE. Redetzke & Salzwedel.	CRARY. McLeand & Kavanaugh.	GREAT BEND. John Worner.	M'CUMBER. Murphy Bros.
ANAMOOSE. E. E. Schlechter.	CRYSTAL. S. F. Waldo & Co.	GLENBURN. Herman Worner.	NECHE. Folkner & Murphy.
ANETA. W. E. Smith.	CALVIN. Krogh & Jacobson.	GARRISON. C. V. Ferguson.	NEW ROCKFORD. John M. Mulvey.
ARDOCK. Halverson & Peterson Bros.	CLYDE. E. F. Koehler.	GUNTHROP. McGray Bros.	T. Ose.
ARGUSVILLE. George Hill.	DAZEY. Nelson & Heimart.	HAMILTON. Bennett & Gunthrop.	NORTHWOOD. Nick Halverson.
ARVILLA. A. F. Erickson.	DES LACE. T. H. Bradley.	HAMPDEN. F. A. Argue & Co.	OSNABROOK. Slawson Merc. Company.
ANTLER. W. J. Raymond.	DRAYTON. Benson & Vestre.	HANNAH. Ole Johnson.	NAPOLEON. C. L. Merrick & Co.
ASHLEY. H. A. Bruenn.	DEERING. Frank Jestrab & Co.	HANNAFORD. Lee Bolster & Co.	OAKES. Fenton & Brown.
BARTON. Melvin Evenson.	DOYON. Charles H. Doyon.	HARVEY. Aarestad Bros. & Troseth.	OMEMEE. L. J. Theroux & Co.
BATHGATE. S. D. Bostwick.	DAVENPORT. Myhra & Fredrikson.	HATTEN. Blanding & Fischer.	ORISKA. Peter Ottinger.
BARTLETT. Simon Schmid.	DEVIL'S LAKE. C. P. Bralnard.	HAVANA. Norgaard & Norgaard.	OSNABROOK. Pioneer Hdw. & Mch. Company.
BERTHOLD. Ever Newgard.	DICKINSON. Frank Lish.	HILLSBORO. Leach & Ellengson.	OVERLY. A. T. Helgesen & Co.
BERLIN. Stone & Finch.	DICKEY. Senour & Langley.	HILLSBORO. Theo. E. Ostlund.	PAGE. J. T. Hanson.
BERWICK. Oppen & Hilmen.	DONNYBROOK. E. & W. Galehouse.	HOPE. J. H. McCollom.	PARK RIVER. L. E. Cook.
BINFORD. Greenland, Pritz & Co.	DRESDEN. McPhail & Brosnahan Company.	HUNTER. Gale, Carr & Co.	PEMBINA. King & Booker.
BISMARCK. Grambs & Wolbert.	DUNSEITH. Fasset & Milloy.	HENSEL. Ault & Graber.	PERTH. Currie & Riggs.
BISBEE. Haskamp-Thien Company.	EASBY. Consolidated Lumber Company.	HANSBORO. Hansboro Mer. & Inv. Co.	PISEK. A. A. Rumerich.
BOTTINEAU. McIntosh Bros.	EASTGATE. Eastgate Hdw. & Lumber Co.	JAMESTOWN. Kirk & Allen.	PLEASANT LAKE. John F. Krill.
BOWBELLS. Donovan Bros.	EDGELEY. Gallup & White.	JESSIE. Jessie Hardware Company.	PORTLAND. Haugen & Grinley.
BOWESMONT. Thomson Bros.	EDINBURG. McEwan-Dougherty & Schuley.	KATHRYN. Louis Larson.	ROLLA. Hills-Kyle.
BRINSMADE. Gunnerud & Muri.	EDMORE. Rosholt Hardware Store.	KENMARE. Simmons & Bodmer.	RUGBY. J. B. Buck.
BROCKETT. Vierhus Bros.	ELLENDALE. Fountain & Palge.	KENSEL. H. N. Tucker Company.	ELLINGSON-GRONVOLD Hardware Company.
BUFFALO. William Merriell.	EMERADO. Mallory Bros.	KINDRED. Ole Qualey.	RUTLAND. Jacobson & Roen.
BUXTON. Christopher A. Hong.	ENDERLIN. Chamberlin-Wallace Company.	KNOX. Knox Hardware Company.	REYNOLDS. W. H. Coffy.
BANTRY. Chas. E. Fee & Co.	ESMOND. Rognlie & Sorenson.	KULM. Gackle & Co.	ROSS. Henry Gralchen.
CANDO. Hunter Bros.	FAIRMONT. Hellskson Bros.	KRAMER. Knoke & Kretchmar.	RUSSELL. Fred. Kjollien.
CARPIO. George A. Dahle.	FARGO. Hubert Harrington.	LAKOTA. Pinkerton-Kellogg Company.	ROLETTE. Sorenson & Thorsen.
CARRINGTON. Thomas Doughty.	M. R. O'Neill.	LA MOORE. H. S. Deisem.	ROCK LAKE. A. H. Lean.
CASSELLTON. Casseltan Hardware Company.	H. F. Emery.	LANGDON. McPhail-Brosnahan Company.	SANBORN. Elmer E. Elliott.
CATHAY. Cathay Hardware & Implement Company.	Sidnam Bros.	E. C. Dedrick.	SHELDON. O. P. Olson.
CAVALIER. K. G. Adams.	FESSENDEN. Fessenden Hardware & Imple- ment Company.	EMERSON & Berg.	SOURIS. Garden Company.
CAYUGA. Walter H. Boomer.	FINGAL. William Schnur.	KULM. Gackle & Co.	ST. THOMAS. J. M. O'Connor.
CHURCHES FERRY. Noitimler & Moe.	FINLEY. Long & Peterson.	KRAMER. Knoke & Kretchmar.	STARTWATHER. A. O. Sather & Co.
CLIFFORD. O. I. Butler.	FLAXTON. Hovland & Swennes.	KRAMEL. F. M. Middleton.	SYKESTON. John Bohlin & Co.
COGSWELL. Cogswell Hardware Company.	J. M. Smith & Co.	LAKOTA. Pinkerton-Kellogg Company.	SHERWOOD. John C. Thoreson.
CHRISTINE. Gus Spencer.	FORMAN. Louis Stelmke.	LA MOORE. H. S. Deisem.	SARLES. Leppert Bros.
COAL HARBOR. Busse Bros.	FAIRDALE. Sorenson Bros.	LANGDON. McPhail-Brosnahan Company.	TOWER CITY. A. M. Moorhees.
COOPERSTOWN. Peter E. Nelson.	FORBES. Hanson & Rorvik.	LANSFORD. Plummer & McNiven.	THORNE. Adelard Riendeau.
COURTNEY. Mat G. Evenson.	GALESBURG. G. A. Moackrud.	LARIMORE. Lamour Bros.	TAGUS. Bush & Morrison.
GRAND FORKS. Redving & Ellestad.	GRAFTON. I. L. Newgard.	LAWTON. Wavrunek & Dolesey.	TRENTON. Chas. E. Evans.
BARNES & NUSS.	GRAND FORKS. Redving & Ellestad.	LEADS. Hilmen Merc. Company.	TOLLEY. F. O. Johnson.
		LIDGERWOOD. Frank J. Smith.	UNDERWOOD. McGray Bros.
		LEEDS. Frante & Son.	UPHAM. Upham Merc. Company.
		LINTON. G. J. Hagg.	VALLEY CITY. Heidel & Getchell.
		LISBON. C. H. Mott.	WALCOTT. O. E. Thue.
		LITCHVILLE. S. P. Nokken.	WALHALLA. McConnachie & Lutz.
		LUCCA. Carlsen & Rollefson.	WASHBURN. Thos. Thompson Hardware Co.
		LANDA. Garden Company.	WALES. Farmers' Imp. & Supply Co.
		LINTON. S. J. Hagg.	WESTHOPE. H. D. Warner.
		MADDOCK. Maddock Implement Company.	WHEATLAND. J. M. Sullivan.
		MANDAN. Chr. A. Helgaard.	WILLOW CITY. Ad. Taguay.
		MANFRED. Rognlie & Sorenson.	WIMBLEDON. More Bros.
		MANVEL. F. M. Middleton.	WYNDMORE. Mellem & Haugen.
		MAYVILLE. Bjelde & Skalet.	WALLUM. Crane-Johnson Company.
		MEKINOCK. Hensrud Bros.	WOLFORD. D. H. Hanson.
		MILNER. Milner Hardware Company.	
		MILTON. Hanson, Newgard & Hanson.	
		MINNEAPOLIS. Johnson & Wroolfe.	
		MINOT. C. L. Richmond & Co.	
		MOORETON. Wm. Plummer Co.	
		MOHALL. Martin & Jacobson.	
		MOORETON. J. A. Roell.	
		MOORETON. C. Jacobson & Co.	
		MOORETON. P. N. Kelly.	
		MOORETON. C. Thoreson & Son.	
		MOORETON. Ferguson Bros.	

COMING HARDWARE CONVENTIONS.

The following conventions of Hardware Associations will be held during February and March.

INDIANA RETAIL HARDWARE ASSOCIATION:

Seventh Annual Meeting at Indianapolis, February 14, 15 and 16. Headquarters and Exhibits at Tomlinson Hall. President, A. N. Shidler, South Bend; secretary, M. L. Corey, Argos.

NEBRASKA RETAIL HARDWARE ASSOCIATION:

Fifth Annual Meeting at Lincoln, February 13, 14 and 15. Membership 248, an increase of 75 since last meeting. President, Max Uhlig, Holdrege; secretary, Frank K. Barr, Lincoln.

IOWA RETAIL HARDWARE ASSOCIATION:

Eighth Annual Meeting at Des Moines, February 14, 15 and 16. Headquarters and Exhibits at Bush Block. President, H. S. Vincent, Fort Dodge; secretary, A. R. Sale, Mason City.

MISSOURI RETAIL HARDWARE AND STOVE DEALERS' ASSOCIATION:

Eighth Annual Meeting at Kansas City, February 20 and 21. Headquarters at Coates House. President, Taylor Frier, Louisiana; secretary, Fred Neudorff, St. Joseph.

ILLINOIS RETAIL HARDWARE ASSOCIATION:

Eighth Annual Meeting at Chicago, February 20, 21 and 22. Headquarters and Exhibits at First Regiment Armory. President, Frank B. McKenney, Rockford; secretary, L. D. Nash, Elgin.

KENTUCKY RETAIL HARDWARE AND STOVE DEALERS' ASSOCIATION:

Sixth Annual Meeting at Louisville, February 20, 21 and 22. Headquarters and Exhibits at Galt House. President, J. C. Frederick, Owensboro; secretary, John R. Sower, Frankfort.

NEW YORK STATE ASSOCIATION OF RETAIL HARDWARE DEALERS:

Fourth Annual Meeting at Binghamton, February 20, 21 and 22. Membership 250, an increase of 25 since last meeting. President, C. P. Sherwood, White Plains; secretary, J. B. Foley, Syracuse.

CONNECTICUT RETAIL HARDWARE ASSOCIATION:

Third Annual Meeting at New Haven, February 27 and 28. Membership 65, about two-thirds of the Hardware merchants of the State. President, Chas. G. Agard, Torrington; secretary, James De F. Phelps, Windsor Locks.

OHIO HARDWARE ASSOCIATION:

Twelfth Annual Meeting at Canton, February 27 and 28 and March 1. Headquarters and Exhibits at Auditorium Building. President, John F. Baker, Dayton; secretary, Frank A. Bare, Mansfield.

MINNESOTA RETAIL HARDWARE ASSOCIATION:

Tenth Annual Meeting at Minneapolis, February 28, March 1 and 2. Headquarters at Nicollet House. Membership 690, an increase of 45 since last meeting. President, A. T. Stebbins, Rochester; secretary, M. S. Mathews, Boston Block, Minneapolis.

NEW ENGLAND RETAIL HARDWARE ASSOCIATION:

Thirteenth Annual Meeting at Boston, March 1 and 2. Headquarters and Exhibits at Hotel Vendome. President, J. B. Hunter, Boston; secretary, F. Alexander Chandler, 36 Federal street, Boston.

PENNSYLVANIA WHOLESALE HARDWARE AND SUPPLY ASSOCIATION:

Annual Meeting at the Hotel Astor, New York City, March 7 and 8. President, H. L. Raub, Lancaster; secretary, John Waeldin, Canton.

CALIFORNIA STATE RETAIL HARDWARE ASSOCIATION:

Fifth Annual Meeting at San Francisco, March 7, 8 and 9. President, H. C. Bennett, San Francisco; secretary, Henry Gracey, 235 Powell street, San Francisco.

NATIONAL RETAIL HARDWARE ASSOCIATION:

Annual Meeting at Chicago, March 20, 21 and 22. President, W. P. Bogardus, Mount Vernon, Ohio; secretary, M. L. Corey, Argos, Ind.

CONVENTION NOTES.

Frank A. Bare, Mansfield, secretary of the Ohio Hardware Association, reports that the enthusiasm engendered by the coming convention at Canton is spreading all over the State. Traveling men are taking great interest in the gathering and giving the names of prospective members to the secretary, who is thus enabled to get on their track and secure their affiliation with the association. Mr. Bare has also received many letters from the members expressing their hearty approval of the policy of making the Question Box a bigger feature of the annual gathering than ever before.

An interesting circular letter is that sent out under date 1st inst. by the Iowa Retail Hardware Dealers' Association, in which the Hardware men of the State are invited to attend the coming annual meeting at Des Moines. Reference is made to some of the objections which are sometimes offered by those who do not care to affiliate with the association, the objections being also taken up and considered. We give the following extract:

We give you below some objections to becoming a member of the association that are sometimes made, none of which, we trust, will apply in your case.

First: "I am too busy attending to my own business to fool away any time trying to regulate some one else's business."

Second: "Why should I belong? The association is not doing anything, the catalogue houses are still doing business. When the association puts them out of business, it will be time for me to consider joining."

Third: "Why should I spend \$10 to \$20 in going to Des Moines to hear a lot of fellows talk? I could tell them all a lot of things they don't seem to know, but you don't need to think I am going to give myself away to my competitors, not much. As to mail order competition, that don't bother me any. I have got that little question solved. If these other fellows are not smart enough to solve it, that isn't my fault, and you can just bet I'll not spend any of my good money in putting them wise."

Let us consider these objections briefly.

First: Don't you realize that when you want anything done in these strenuous times you must call on a busy man to do it for you. A man that isn't busy nowadays does not want to and will not get busy.

This would be a very unsatisfactory old world to live in if every man in it attended only to his own little narrow business. Now own up, wouldn't it? Don't you think that when you are working to improve general trade conditions you are working to improve your own business?

Second: If you wait until this or any other association puts the mail order houses out of business before you join, you will wait some time. Any one at all familiar with this question has never expected to put any one out of business. It isn't always necessary to put a competitor out of business in order to successfully compete with him.

If you have kept in touch with this question you cannot help but know conditions have been vastly improved for the retail Hardware merchant, and as a direct result of association work. The reason why there has not been greater progress made in this direction is that you and others that hold similar views have held back in the traces instead of taking hold and helping to pull.

It is an easy matter to criticize the work of others, but not always so easy to suggest a better way.

Third: As to spending \$10 to \$20 to hear a lot of talk, if you go to Des Moines in February and attend every session of the convention and don't get value received for every dollar it will cost you we are almost tempted to say the association will be willing to pay you back your money. Just study the programme carefully and see if there is not some feature in which you are particularly interested.

As to having the mail order house problem solved, just make a few visits to your local freight depots, and you will soon be convinced of your mistake.

It may be that you are waiting for business to pick up before joining. Did it ever occur to you that you might get some ideas at a convention that would enable you to improve your business? You have no doubt given everything else a trial. Why not try this? You would not have to improve your business very much to pay the cost of the experiment.

The letter is signed in *fac simile* by the officers and directors of the association.

THE CHAMPION MFG. COMPANY, Rocky Hill, Conn., iron founder and manufacturer of Hardware Specialties, has arranged with the Smith & Hemenway Company, 296 Broadway, New York, to market its entire product on Axes, Hammers, Hatchets, Can Openers and seasonable goods, such as Ice Picks, &c.

The next meeting of the Pennsylvania Wholesale Hardware and Supply Association will be held March 7 and 8 at the Hotel Astor, New York City.

Parcels Post Campaign.

FROM OUR SPECIAL CORRESPONDENT.

WASHINGTON, D. C., February 6, 1906.

THE promoters of a domestic parcels post are urging an insidious proposition upon Congress on the basis of a series of resolutions adopted by the National Board of Trade, which held its annual convention in this city week before last. In spite of the earnest appeals of the opponents of the parcels post the board adopted a resolution recommending to Congress an investigation to ascertain the practicability of a parcels post, and especially to determine whether such an institution can be maintained "without loss to the Government." The project for an investigation is looked upon by the opponents of the scheme as a dangerous entering wedge designed to give the plan a status in Congress, which it could not otherwise secure.

No less than ten commercial organizations in various parts of the country presented resolutions to the National Board of Trade favoring penny postage, parcels post and other projects, and while a strongly worded resolution calling for the reduction of letter postage to 1 cent per ounce was adopted, there was coupled with it a proviso urging a Congressional investigation with a view to ascertaining whether a parcels post would operate "to the interest of the greatest number of people" and without loss to the postal service. Fortunately for the retail merchants of the country the condition attached to this proposition is absolutely fatal, and this was pointed out to the Board of Trade with much emphasis by the representatives of important retail interests in various trades.

The Ten Propositions

concerning postal reform submitted to the convention by affiliated organizations were referred to a Committee on Postal Affairs, which, however, was made up, designedly or otherwise, of the chief advocates of a parcels post. The committee proved to be unanimously in favor of penny postage, but six of the seven members insisted on adding the wholly illogical and contradictory proviso already referred to. The text of the resolutions as reported by the committee was as follows:

Resolved, first, That the National Board of Trade reaffirm their advocacy of 1-cent letter postage and earnestly recommend the prompt passage by Congress of a bill to reduce letter postage to 1 cent per ounce, which rate, according to former reports of the Post Office Department, would yield the Government a large profit:

Second, That for the correction of existing abuses in transportation of mail matter all other classes shall be compelled to pay at least the actual cost of handling and transportation;

Third, That in deference to the widespread discussion of the question of a parcels post by commercial organizations of the United States we recommend to Congress the serious consideration of the subject with a view to ascertaining whether it can be adopted with advantage to the interests of the greatest number of our people and without loss to the Government.

T. James Fernley's Address.

When the Committee on Postal Affairs presented its report it was sharply antagonized by T. James Fernley, the secretary-treasurer of the National Hardware Association, who offered as a substitute an antiparcels post resolution proposed by his association. In support of his substitute Mr. Fernley said in part:

Representing the wholesale interests of the country in the matter of Hardware, I desire to say that we feel, and you know it is a fact, that there is quite a disposition nowadays to eliminate the middle man—quite an inclination to get articles directly from the mill to the consumer, involving not only the elimination of the middle man but of the retail merchant. You may not all be aware of it, but in one or two cities of the country, and notably in Chicago, there are several mail order or catalogue houses, concerns that employ no traveling salesmen and that do not extend credit but require cash with orders, that publish catalogues containing about 1600 pages, which are mailed to the farmers and to the consumers generally, offering goods at prices which no retail merchant could maintain and have left any margin of profit. A few of those mail order houses have built up an enormous business. The wholesale merchants of the country are

SUFFERING SEVERELY

from this sort of competition. Our customers are the retail merchants of the country. There are 150,000 or 200,000 little country stores in the United States that are a necessity to their respective local communities and they are being seriously hampered in the conduct of their business by the competition of these mail order concerns. The great difficulty the catalogue houses have, however—and this is the only reason they have not grown more rapidly—is the expense of shipping and delivering goods to the consumer. Now they come along and advocate this parcels post bill because they realize that if they can take an 11-pound package and send it by mail to the uttermost parts of the country, even to our insular possessions, for 25 cents, they can enter into very successful competition with all classes of merchants and build themselves up and destroy the business of hundreds of thousands of retailers and middle men.

While I represent the National Hardware Association of the United States, I also represent, through the joint committee of the two bodies of wholesalers and retailers, about 25,000 retail merchants in the hardware line. While I can only speak officially in regard to hardware, yet I want to tell you that there is not a line of goods represented by delegates to this National Board of Trade from any of its affiliated bodies but whose operations are very seriously affected. This competition concerns almost everything you use from the time you are born until you die, from your cradle to your coffin. They also keep tombstones, as you will see by their catalogues. Everything that is used from birth to death is supplied by these mail order houses.

INNOCENT, BUT LOOK OUT.

I grant you that this resolution is an innocent one. It is very mild. It only calls for an investigation. But I hold that we of the National Board of Trade do not desire to recognize a parcels post in any way, shape or form. Now, if we are honest—and we are—in our desire to have 1-cent letter postage, why do we sidetrack ourselves in any particular? We have been going after 1-cent letter reform and other reforms, but rural free delivery has come in and a deficit of \$2,000,000 or \$3,000,000 has been increased to about \$15,000,000. Now, while you are after 1-cent letter postage, but flirting with the parcels post, the first thing you know you may get the parcels post, and there is not a man in this room who has a child that will ever see 1-cent letter postage.

Please do not say that this resolution is a mild one because it only calls for an investigation. It is a very serious matter. The committee gave a great deal of attention to this subject, but I feel that this question of a parcels post in our country cannot be compared with the condition in foreign countries. I would hail with pleasure any measure that would aid in building up our foreign trade, but let us under all circumstances hold on to our home trade first. It seems to me that the establishment of the parcels post would seriously cripple the wholesale merchants of the country and would ruin the retail dealer who is so important a factor in his community.

Parcels Post Revolutionary.

Delegate Hitchcock of Scranton, Pa., made a strong argument against the parcels post fallacies. He said in part:

In the first place, we want one-cent letter postage. That is definite. There is no question about it. But why do we want to encumber matters and put that off so far that we can never see it?

What is going to be the effect? I say it is revolutionary! We have never gone to this point. It will only stop with the adoption of the principle of Government ownership of public utilities. There's where it will come out. We cannot compare this country with Europe, because there are no long hauls in Europe. No government of Europe carries packages a distance of more than 200 or 300 miles, except Russia. So we cannot compare our conditions with those of Europe, but if you start this system you will simply impose upon the Government of the United States the duty of carrying these packages 300, 500, 1500 or 3000 miles, when it will cost the Government about four or five times what it will get for the service. The express companies will get all the short haul business and make all the profit.

Other Addresses.

The committee's report was opposed by Delegate Burrows of Cleveland, a close student of postal affairs, who has occasionally addressed conventions of the Hardware trade, and also by Delegate Lloyd of Pittsburgh, who declared that in voting against a parcels post, the National Board of Trade was "surely voting in favor of the people

it represents." A. P. Anderson, the Commissioner of the Board of Trade, who was formerly postmaster at Cleveland, was then called upon and made a very plain talk with regard to the committee's report. He said, in part:

I have had a little experience in the postal business, and I shall be very frank with you in speaking of this proposition. The words of your report, "to be conducted without loss to the Government," are fatal to your cause because you can never have in this country a parcels post without loss to the Government conducted as it is in England, France, Germany, Belgium, &c. What is the reason? Because there are natural obstacles in the way. The enormous area of this country is one important consideration. Excluding our possessions, we have railroad hauls of 3500 miles, as against 425 miles in Great Britain. This condition cannot be offset by any superior efficiency on the part of our carriers or postal clerks, for there is a limit to human dexterity and to the physical endurance of man. Now if we are to have a parcels post corresponding to that in vogue in Europe we must have substantially the same conditions that obtain in those countries. Such conditions we cannot have. In Germany, for example, they simply compel the railroads to transport their heavy mail free of charge. No compensation is paid by the Government for the haulage of that class of matter. The reason is that the Government practically owns the railroads. If the railroads of this country will agree to transport parcels post matter free, we can easily establish the institution here, or if the taxpayers will agree to stand the expense we can no doubt have it.

Something has been said about the British parcels post and its cost. The only way it can be made to show a profit is by the bookkeeping. They can keep books just as they please and the taxpayers have to foot the bill. When Great Britain took over her telegraph system, which had been profitable up to that time, it soon ceased to pay dividends and never has shown a profit since. The fact is, that in all these questions concerning the activities of the Government which encroach upon private interests and private rights there is great danger because you are disposed to lean too much on the Government. I am a great believer in the doctrine of individual effort, and the reason I believe in that doctrine is because I want to give the greatest play to American genius along every line so that every man will feel that his own efforts will be rewarded to a degree commensurate with his intellectual development and energy.

At the close of the discussion Mr. Fernley demanded a vote on his substitute, which was beaten, and the committee's report was then adopted. There can be no doubt that a principle of "mutual courtesy" which might be more harshly denominated "log-rolling," governs the proceedings of the National Board of Trade, and it rarely happens that a committee report is rejected. By thus accepting all reports the Board is able to dispatch a vast amount of business relating to great public questions in an astonishingly short space of time. While the defeat of Mr. Fernley's substitute is greatly to be regretted, it is fortunate that the condition coupled with the Board's recommendation concerning the parcels post—namely, that it shall be conducted without loss to the Government—absolutely precludes the authorization of such an institution even on the most conservative basis thus far suggested.

W. L. C.

A DINNER TO EMPLOYEES, including heads of departments, traveling salesmen and assistants in the office and warehouse, was given by the Brown-Wales Company, 69-83 Purchase street, Boston, at Young's Hotel, Saturday, January 27. Addresses were made by President John G. Brown, Treasurer William Q. Wales and Secretary William H. Shurtleff, followed by remarks from heads of departments, salesmen and others. The president congratulated those present on the success of the business in 1905 and gave words of encouragement for 1906, which he said had opened very auspiciously. The business in Shelby Cold Drawn Seamless Steel Tubes, for which the firm is Eastern distributor, has shown a large increase, as has also that in Plumbers', Steam Fitters' and Tinsmiths' Supplies, of which a large and varied stock is carried. The company has been appointed sales manager for New England for the Stowell Mfg. & Foundry Company's Floor and Side Wall Hot Air Registers and Ventilators. A stock of the leading sizes of these Registers, as well as a stock of Iron and Slate Borders to fit them, is carried.

The Proposed Catalogue of the Western Heavy Hardware Jobbers.

TOO FUNNY, TOO RIDICULOUS.

To the Editor: The proposition of the Heavy Hardware Jobbers' National Association, as outlined in your issue of the 25th ult., is an astounding one. Had I been told of it instead of reading it in *The Iron Age* I would have either doubted the statement or taken it with some degree of allowance. To a certain extent it offers advantages to the consumer or small dealer, who can thus have a standard list in one book; but the objections are so great that they overshadow and obliterate all arguments in its favor.

IN THE FIRST PLACE

the committee proposes only to accept of lines which in its opinion shall be catalogued—you will notice it is not for the man who pays the bill to determine whether it shall be catalogued, but the committee. Again it suggests to each one, if you overbid your competitors you will have a better position in the catalogue or get some advantage over the other fellow.

GOOD FOR SIX YEARS.

Then this catalogue is supposed to be good (?) for six years. Just think of it, in these days when new inventions and methods are offered to the trade daily, these industries shall stand still for six years and not move a foot, unless those who make new articles catalogue them themselves, irrespective of this jobbers' catalogue!

WHAT INCENTIVE

is there for a live, wide-awake manufacturer, or any of his able employees, to bring out something new and desirable and something profitable to the user as well as to the maker? This is almost offering a premium for idleness.

It is gratifying to read that this scheme will do away entirely with solicitations for contributions for individual jobbers' catalogues. Individual jobbers will not stand any show at all, because the manufacturers' money is already given up for those 50,000 catalogues!

I fail to see, however, how this would relieve the manufacturers from issuing individual catalogues, as they have in the past, for doubtless many articles would not be catalogued by the committee, and such goods, together with any new goods, would have to be covered by an independent catalogue, just as heretofore.

THIS QUEER KIND OF A PROPOSITION

should not give offense to any one; it is too funny and too ridiculous to be offered by business men to other business men of sense. Do not tell them I told you so, however, because no doubt they are good fellows and I do not want to hurt their feelings.

CENTRAL WEST.

IS IT ADVERTISING?

To the Editor: We note with interest the Norvell-Shapleigh Hardware Company's article in your last issue, especially the comment that unless a jobber "speaks out in meeting" his position is ignored.

We are of the opinion that jobbers in the past have not been bashful or backward at any time in presenting to the public and especially the retailers their side of any question of any moment presented for discussion.

ALL OF THE JOBBERS

have for years when making their second urgent request of manufacturers to donate for catalogue "advertising" stated that it was the best advertising medium that the manufacturer could use. They never have had a very strong argument to back up their assertion and have never been able to prove their statement to the satisfaction of any manufacturer.

Will any live, up to date jobbing house, like the Norvell-Shapleigh Hardware Company, admit that its catalogue is an advertising medium—i. e., manufacturers' lines that are most liberally subscribed for are given preference and those not paid to have illustrated omitted?

THE PROBLEM

with all the large jobbers is how to reduce the size of their cumbersome catalogues, and we doubt if any of the large, aggressive jobbers will add to his catalogue a single item simply because a manufacturer is willing to pay for the space used. He will illustrate the goods he desires to represent and sell and if a line is profitable and satisfactory it will be illustrated, whether the manufacturer "donates" or not. If a jobber wants a line pushed he so instructs his salesmen, and if a line is so well known and advertised (not in Hardware catalogues) that there is a demand for this article, the jobber is obliged to illustrate and carry it in stock, even if he prefers not to do so.

A manufacturer of goods having merit can so advertise them that he will force the jobbers to illustrate at least the staple patterns.

A majority of the best known lines, with open selling prices, "advertised" only in jobbers' catalogues under factory brands, will decrease in sale within five years until no jobber will be willing to illustrate them, even if paid a high price for the space. This being the case does catalogue "advertising" pay?

A retail merchant rarely looks over a Hardware catalogue to see what he needs when making up mail orders. He will possibly refer to the jobber's catalogue to see if it shows the goods he wants and for proper descriptions, &c.

ADVERTISING

is to call attention to and create a desire for the article named. The jobber's catalogue does not do this. Catalogue "advertising" boiled down means donation of the manufacturer to the jobber to keep the latter's good will, as no progressive jobber will illustrate undesirable goods because he is paid so much per page to do so, or omit desirable goods the manufacturer fails to "put up" to have illustrated. It is not legitimate advertising, and when a manufacturer is "held up" here and there he eventually gets tired and looks for other fields or methods of marketing his wares.

A SIGNIFICANT INCIDENT.

This week one of the largest manufacturers in the United States in its line, and of a class of goods shown in nearly every Hardware jobber's catalogue, called in its sales managers from St. Louis, San Francisco, Chicago and New York to consider withdrawing from the jobbing trade entirely and confining its sales in future to the retailers and large consumers. By this I do not mean to infer that the jobber is "a thing of the past," is not here to stay, but many profitable lines will soon be marketed through other channels unless the jobber ceases to make unreasonable demands upon the manufacturer.

It is because we feel most kindly toward the jobber and wish him well that we try to point out the error of his ways. He certainly cannot improve present conditions by trying to place the blame and burden of the catalogue house situation on the manufacturers, forcing them to "advertise" or trying to kill factory brands.

ED. FORD.

TROUT HARDWARE COMPANY.

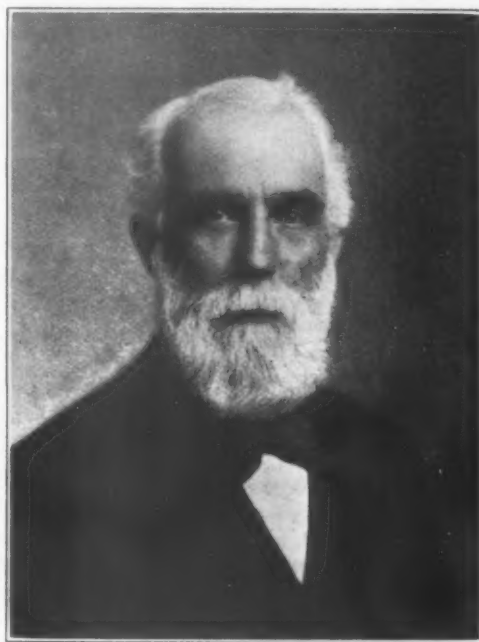
OWING to the rapid growth of its business, the total sales of 1905 showing an increase of over \$250,000, the Trout Hardware Company, Chicago, has increased its capital stock from \$200,000 to \$250,000. This company was founded in 1893 by George W. Trout and George W. Sackett under the firm name of Trout & Sackett and the first quarters were small and the capital limited. The business, however, was prosecuted with great energy and the policy pursued in dealing with the trade resulted in greatly increased sales from year to year, and in 1903 the firm was incorporated under the name of the Trout Hardware Company, with a paid up capital stock of \$200,000, and located in its present quarters at 174 to 176 Lake street, which comprise a five-story building, basement, with a warehouse annex. Following the incorporation the growth has been unprecedented, requiring increased capital, as heretofore noted. The working force has also been increased, new territory opened up and the number of traveling men added to. Charles Milversted, formerly

with Hibbard, Spencer, Bartlett & Co., has recently been appointed general sales manager. He is well known to the Hardware trade throughout the Northwest and began selling on the road when but 17 years of age. He is well fitted for the position and his ability and popularity will insure many new friends for the firm. The active management of the Trout Hardware Company is in the hands of George W. Trout, president and treasurer, and Stewart B. Wilbur, secretary; directors, George W. Trout, Stewart B. Wilbur, Wm. N. Baker, J. Murray Hoag and C. Van der Zwall.

DEATH OF ALFRED M. WRIGHT.

ALFRED M. WRIGHT, for many years president of the Connecticut Valley Mfg. Company, died at his home in Centerbrook, Conn., on January 13, aged 68 years. The immediate cause of his death was heart failure.

Mr. Wright was born on a farm in Westbrook, Conn., March 5, 1838. He was educated in the neighboring schools and at Adrian College, Mich., which he left to enlist in the army during the Civil War. In 1874, upon the ruins of a bankrupt concern, Mr. Wright organized



ALFRED M. WRIGHT.

the Connecticut Valley Mfg. Company and began the manufacture of all kinds of Wood Boring Tools. The entire charge of the company was entrusted to him and the responsibility he keenly felt, as was shown by the years of constant and close attention he gave to the business, which has grown to be a leading enterprise and the line of goods widely and favorably known.

Mr. Wright always took a deep interest in politics. In politics, as in business, he was honest and upright, untiring and farseeing, and in later life, when he could throw off the cares of his business, official honors came to him. He had held many town offices, had been County Commissioner, State Senator from 1897 to 1899, was one of the vice-presidents of the Pan-American Exposition, director of the Saybrook National Bank of Essex and trustee of the Columbia Trust Company of Middletown. He belonged to the F. and A. M., A. O. U. W., O. U. A. M., the G. A. R. and The Grange. He was always active in church, Sunday school and charitable work.

In 1864 he married Mary J. Hull of New Haven, Conn. He is survived by a widow, one daughter, Mrs. H. W. Webber, and two sons, Walter H. Wright, the present Representative of the town of Essex, and Attorney-at-Law Northam Wright, treasurer and secretary, respectively, of the Connecticut Valley Mfg. Company, who for the past few years have taken the active part in the management of the business. Mr. Wright's memory will be cherished by many business, political and social friends.

Letters from the Trade.

Our readers are invited to discuss in these columns questions of trade interest connected with the manufacture or sale of Hardware. We shall be pleased to have a free expression of opinion on subjects deserving the attention of Hardware merchants and manufacturers.

UNINTELLIGIBLE SPECIFICATIONS.

From a New York Manufacturer: In your issue of January 4, among many contributions is one by the genial William H. Maher, who under the caption of "Buyers Then and Now," becomes almost irascible over the conduct of the present day buyer. His remarks apply mainly to those who buy shelf or standard supplies.

A Prevailing Condition.

The following will be recognized as a condition which prevails with those who furnish supplies of a character which are required to be made in accordance with specification. An important and vital factor in economy of production and maintenance of industrial establishments, and operation of mines, railroads and other enterprises of kindred character, making large purchases of miscellaneous supplies, is the procurement of such at the lowest prices compatible with the highest value, for a well defined need.

To accomplish this fully an indispensable prerequisite is that the buyer or purchasing agent should possess some knowledge or training in the details of the operations for which the supplies are intended, so as to ensure to the mine or shop management the receipt of the precise requirements.

Necessary Qualifications.

To buy cheaply without a full appreciation of the latter desideratum is extravagant because important intents may be frustrated, or trade lost through the use of imperfect or inferior tools, appliances or stock. A common practice of a purchasing agent or buyer, as known to your readers, is to send out invitations to bid on specifications, often "weird" in description, or lacking essential particulars to enable the bidder to exercise intelligent judgment or comprehension as well as avoid disputes after the shipment.

Requisitions, no doubt, are frequently received by the buyer from shop superintendents, perhaps specified meagerly or in the same familiar terms they employ with practical associates, or, when originally precisely expressed, undergo some mutilation when transcribed by youthful subordinates totally ignorant of the subjects, and then further tangled by the buyer, which results in the presentation of wants so obscure or absurd as to perplex veterans in the specialties of manufacture.

Obstacles.

Such is a common experience with manufacturers and jobbers eager to bid upon the needs of private or incorporated enterprises or the many departments of the United States Government. Upon receipt of imperfectly expressed specification, those through selfish or conscientious motive wishing to supply the precise need, rather than an expressed want, and recognizing the difference between the terms "want" and "need," are often compelled to ask for a revision or confirmation of the specifications.

The purchasing agent, or buyer, has been selected by those in authority as qualified to procure supplies to meet the requirements of the works. He feels himself to be equal to the need. He is burdened with duties of his office. If those requiring the supplies are in error in their descriptions, or if his own subordinates have committed such in transcription, he seemingly is indifferent.

Fuller Information Denied.

When a clearer interpretation is asked, it is rare that recognition is obtained by any acknowledgment or revision, and the field is thus left open to many to bid on the want as expressed, and guess at the need, assuming the responsibility of discovery. This in some supplies of other than highly finished products, is slight,

from the fact that the other miscellany is received at the shops, and without test or examination are applied to intended uses, and the endurance or efficiency not fully noted.

It seems almost superfluous to present these unfortunate conditions, because though well known, few opportunities are offered for remedial action.

VETERAN.

HARDWARE ASSOCIATION PROGRAMME ADVERTISING.

To the Editor: We heartily agree with the "Prominent Manufacturer," who in *The Iron Age* of January 18 comments on the "advertising graft" of Hardware associations.

As stated, when these associations were in their infancy and struggling for an existence for the "good of the cause," their friends were ready to assist them, but now there are entirely too many, and they should be self sustaining.

Programme Advertising Is Not Profitable,

as has been proved repeatedly. Many when solicited fear if they refuse the offer that the members will construe their refusal as meaning that they are unfriendly to the movement. Some of the jobbers who desire to make "grand stand play" for effect can afford to use a page or two of the programme, but not so the manufacturer who is called on to contribute from Maine to Washington, from North Dakota to Texas.

The retailers and jobbers now know where the manufacturers stand according to their Blue Book list we hear so much about, and are guided by it and not by the programme advertising, hence the manufacturer need not feel he will be boycotted if he does not subscribe to the programme, but should rather see if his name is "favorable" or "unfavorable" on this selected list the jobbers have compiled for the retailers.

Years Ago It Was the Practice

of the jobber to "lay tribute" on the manufacturers whose goods were illustrated in the large Hardware catalogues, and we are reliably informed that many of the first editions were oversubscribed. Now, when the jobber complains of the enormous expense he has been to in getting out a large catalogue in years gone by the knowing ones blush for them and wink the other eye.

We positively know that some of the large jobbers when they receive favorable replies to the first requests for catalogue contributions comment among themselves "he is easy." This of late has become so annoying to the manufacturers that it was taken up by the association and the jobbers at their association meetings as well, and it was agreed that in future these demands should not be made, but privately the jobbers continue to write the manufacturers and the "easy ones" still help pay for the jobbers' catalogue, but there are so many now who have discovered that in an early day the manufacturers paid for the jobbers' catalogues that every semijobber, as well as the legitimate exclusive ones have taken up the "hold up" plan until it has forced manufacturers to refuse, for if extended to one it would of necessity have to be granted to all, and would mean a large share of the profits of many manufacturers, as there are at least 100 large Hardware catalogues issued annually in the United States and Canada besides the hundreds of specials illustrating special lines, such as Cutlery, Silver Ware, Sporting Goods, &c.

If the manufacturers feel the demand for contributions to these catalogues a graft should not the programme be so considered and treated the same as any other hold up?

Manufacturers Who Are "Easy"

will continue to contribute to them both, and the recipients chuckle over their credulity, while legitimate advertising will suffer therefrom.

Is it not time for the jobbers and the Hardware associations to discontinue this practice, which is acknowledged by all to be anything but a business proposition?

These requests do not elevate in the estimation of those receiving them the business character of the ones making the request.

NEW ENGLAND.

PRICE-LISTS, CIRCULARS, &c.

Manufacturers in Hardware and related lines are requested to send us duplicate copies of catalogues, price-lists, &c., one copy for our catalogue department in New York and another for our London office; and at the same time to call our attention to any new goods or additions to their lines, of which appropriate mention will be made, besides the brief reference to the catalogue or price-list in this column.

BONNEY VISE & TOOL WORKS, 3011-3015 Chestnut street, Philadelphia: 1906 catalogue of Vises for all uses, Combination Pipe and Monkey Wrenches and Pipe Cutters, Machinists' Tools and Hardware Specialties.

BAKER, McMILLEN COMPANY, Akron, Ohio: Catalogue of Akron Eclipse and Standard Eclipse Levels handsomely illustrated in natural colors.

HENDRICK MFG. COMPANY, Carbondale, Pa.: Handsome catalogue of Perforated Metals, including Screen Plates, Revolving Screens, Elevator Buckets and Conveying Troughs, &c.

CLIMAX TAG COMPANY, Dayton, Ohio: 1906 catalogue of Spring Cotters, Flat Spring Keys, Flat Riveted Keys and Pressed Steel and Wire Forming Work.

BUFFALO MFG. COMPANY, Buffalo, N. Y.: Illustrated booklet referring to American Coffee and Tea Extractors.

CHADBORN & COLDWELL MFG. COMPANY, Newburgh, N. Y.: Catalogue of Lawn Mowers, illustrating the company's various brands and containing trade price-list.

STAR EXPANSION BOLT COMPANY, 147-149 Cedar street, New York: Catalogue No. 14, referring to Expansion Bolts, Screw Anchors, Machine Expansion Bolts, Star Cable Dogs, Bridle Rings, Toggle Bolts, Stone Drills, &c.

LALANCE & GROSJEAN MFG. COMPANY, 19-21 Cliff street, New York: Catalogue illustrating, with list prices, Seamless Wrought Steel Kitchen and Pantry Sinks, Sink Backs and Plumbers' Supplies.

HEATH & MILLIGAN MFG. COMPANY, Chicago: January issue of "Co-operation and Expansion," a house organ, devoted to Paints.

JOHN ERNSDORFF IRON COMPANY, Dubuque, Iowa: Illustrated catalogue and price-list No. 5, covering an extensive line of Heavy Hardware, Carriage and Wagon Materials, Iron, Steel, Blacksmiths' and Wood Workers' Supplies, Carriage Trimmings, Paints, Oils, Varnishes and Brushes. It is a fully illustrated book of 448 pages.

SARGENT & Co., New Haven, Conn., and 149-153 Leonard street, New York: Sixty-page illustrated catalogue of Spring Balances and Scales and display card in colors relating to its line of Steel Squares.

LOWELL SCALE COMPANY, 605 Middlesex street, Lowell, Mass.: Catalogue relating to Platform, Warehouse, Union and Family Scales. Since the issue of the company's last catalogue several additions have been made to the line.

S. L. ALLEN & Co., Philadelphia, Pa.: Catalogue of Planet Farm and Garden Implements, including Seeders, Drill Hoes, Hand Plows, Wheel Hoes, Celery Hillers, Cultivators, Horse Hoes, Harrows, Potato Diggers, &c.

THE HUMPHRIES MFG. COMPANY, Mansfield, Ohio.: "Spraying for Profits," a catalogue illustrating Spraying Apparatus and giving formulas for spraying mixtures, together with a spraying calendar for fruits and vegetables.

AMES PLOW COMPANY, Boston, Mass.: Illustrated catalogues of Matthews' New Universal Seed and Cultivating Implements, including Seed Drills, Combination Seeder, Hoe, Cultivator, Plow, Rake and Marker; Cultivators, Hand Wheel Plows, Hand Grinding Mills, &c.

DAVIS MFG. COMPANY, 935-939 Thirtieth street, Milwaukee, Wis.: Hardware specialty catalogue, illustrating Barn Door Hangers, Antifriction and Roller Bearing Hangers, Barn Door Rail, Stay Rollers, Post Hole Diggers, Wire Stretchers, Trammel Points, Micrometers, &c.

BATEMAN MFG. COMPANY, Grenlock, N. J.: Illustrated catalogue of the Iron Age Farm and Garden Implements, including Drill Seeders, Wheel Hoes, Cultivators, Potato Planters and Diggers, Sprayers, &c.

AMERICAN CUTLERY COMPANY, Chicago, Ill.: Catalogue

illustrating a line of Scales, including American Family, Young American, Sunbeam Candy and Spice and American Grocer Scales.

THE REVERSIBLE TUBE CLEANER COMPANY, 24-26 Southbridge street, Worcester, Mass.: Catalogue devoted to Criss Cross Flue Cleaners and Gun Cleaners.

REQUESTS FOR CATALOGUES, &c.

The trade are given an opportunity in this column to request from manufacturers price-lists, catalogues, quotations, &c., relating to general lines of goods.

REQUESTS for catalogues, price-lists, quotations, &c., have been received from the following houses, with whom manufacturers may desire to communicate.

FROM HARRIE G. JOHNSON, successor to W. L. Cole, Clarksburg, W. Va., in the Hardware, Stove, Tinware, Agricultural Implement, Paint and Sporting Goods business.

FROM JOYCE & SCHRADER, successors to John Armstrong, Syracuse, Neb., retailer of Hardware, Stoves, Tinware, Agricultural Implements, Sporting Goods and Harness.

FROM MILLER & GIBLER, successors to J. W. Miller, at Claflin, Kan., in Hardware, Stoves, Tinware, Agricultural Implements, Paints, Oils, Sporting Goods, Wall Paper, Harness and Buggies.

FROM BOONSHOT HARDWARE COMPANY, INCORPORATED, successor to Shawhan, Boonshot & Co., Petersburg, Ind., retailer of Hardware, Stoves, Tinware, Agricultural Implements, Paints, Vehicles, Seeds, Sporting Goods, &c.

FROM WIGHT HARDWARE COMPANY, Cairo, Ga., which was organized January 1 and has been incorporated with a paid up capital of \$16,000. The company succeeds Thomas Wight in the retail Hardware and Jewelry business.

FROM EMIL KUGEL, successor to J. E. Menzie, Grafton, Neb., in Shelf and Heavy Hardware, Stoves, Tinware, Agricultural Implements, Paints, Oils and Wind Mills.

FROM McALLISTER HARDWARE COMPANY, Lumberton, N. C. The company is about to erect a new building and desires printed matter and other particulars relative to store fronts and store fixtures.

FROM W. W. KINSEY, who has purchased the Hardware business of D. C. Kinser, Promise City, Iowa.

FROM CASHON HARDWARE COMPANY, Petersburg, Va., which carries a retail stock of Hardware, Cutlery, Guns, Wood Pumps, Chimney Pipe, &c.

FROM BALDWIN & HENDRICKS, who have purchased the Hardware business of Jno. Botsford at Cherryvale, Kan.

FROM HALL & McCURDY, successors to Smith & Son, Whipple, Ohio, who will handle a full line of Hardware in connection with general merchandise.

FROM BRAUNFELS, BROWNING & Co., who have been incorporated under the New York State laws with an authorized capital of \$100,000 of which \$30,000 has been paid in. The new concern will handle Mechanics' Tools, Contractors', Factory and Engineers' Supplies and Builders' Hardware. Two stores will be operated and are now ready for business, situated at 1940-1942 Park avenue, and 57-63 East 131st street, New York.

The Lindquist-Holt Company, Des Moines, Iowa, has been organized, purchasing the stock of hardware formerly owned by Gross & McGarraugh. The incorporators are John Lindquist, Martin J. Holt and C. H. Gross.

AMONG THE HARDWARE TRADE.

R. O. Mudgett has bought the interest of H. N. Gray in the firm of Gray & Mudgett, Essex Junction, Vt., and will continue the business under the name of R. O. Mudgett & Co.

J. G. Trentlage, for 35 years a hardware merchant at Milwaukee, Wis., has announced his intended retirement. The business in which he has been engaged will be carried on by his son and grandson under the firm name of A. T. Trentlage & Son.

The Hardware store of C. Witbeck, Schenectady, N. Y., has been completely destroyed by fire. A new store is being put up which will be fire proof.

The Hardware and Furniture business of J. T. Murphy, Naples, Texas, has been purchased by Holman & Roberts.

The New York Hardware Company, Perry, Okla., has been incorporated with a capital of \$15,000.

The Hardware and general store of J. O. Olmstead, Richmond, Vt., has been taken over by Richmond Hardware Company, E. E. Fish, proprietor.

T. E. Averill has succeeded to the Hardware, Stove and Sporting Goods business of Averill & Metcalf, Ohlawa, Neb.

I. E. Calvert has sold his interest in the Hardware business of Long & Calvert, Garnett, Kan., the firm becoming Mason & Long.

The Hardware business lately conducted by the estate of Abraham Kline, Manheim, Pa., has been sold to Manheim Lumber & Hardware Company.

Frank Gould Hardware & Implement Company has been incorporated in Blackwell, Okla., with a capital stock of \$10,000.

The Hardware, Stove, Paint and Sporting Goods business of Alexander Mayer, Falls City, Neb., has been purchased by J. C. Tanner, who will take charge February 1.

V. E. Philp has bought the interest of J. M. Gillespie in the firm of Spradling & Gillespie, Huntington Beach, Cal., and the style has been changed to Huntington Beach Hardware Company, F. C. Spradling and Mr. Philp constituting the firm.

M. M. Wilkins, Everly, Iowa, has sold his Hardware, Stove and Paint business to F. W. Jenks.

C. P. Barber, Kirwin, Kan., has sold his Hardware, Stove, Implement and Sporting Goods business to Gray & Stagg.

MISCELLANEOUS NOTES.

Smith & Hemenway Company.

The Smith & Hemenway Company, 296 Broadway, New York, has increased its facilities for production in glaziers' tools by the addition of a new building 30 x 70 feet, in which to manufacture the various styles of Red Devil and Woodward glass cutters. One of the latest designs is the 030 glass cutter of the Red Devil brand, having a square end with which to drive or push in glaziers' points in window sash in the process of glazing. A sample of this cutter will be sent on application.

Gluc-Glue and Gluco-Glutin.

The Acme Chemical Company, Brooklyn, N. Y., for whom E. C. Fischer, 640 Broadway, New York, is sole selling agent, has recently begun the manufacture of Gluco-Glue No. 1 and Gluco-Glutin No. 2. These prepa-

arations combine the properties of liquid gums, gum pastes, painters' liquid glue paste, &c., and are of vegetable origin. They are referred to by the company as neutral, odorless, colorless and flexible, being serviceable for innumerable purposes, including bookbinders, paper box and cigar makers, wall paper manufacturers, &c. They are said to keep sweet indefinitely and are put up in barrels containing 400 to 500 pounds. The company will send free of charge to large users a 10-pound pail sample for trial, express prepaid.

Improved Three Coin Registering Savings Banks.

The Piaget Novelty Company, 265 Broadway, New York, which manufactures registering savings banks, patented specialties and novelties, has just commenced to market an improved form of its three coin registering bank, as here illustrated. Outwardly it closely resembles a similar bank shown in these columns two years ago, with this difference, that instead of a removable top to empty the bank, when a total of \$5 had accumulated, the barrel like bank is for practical purposes but one piece. The opening mechanism causes the door marked "open" to slide sidewise when \$5 is reached to withdraw the money, thus obviating some difficulties experienced in the former construction. The bank is made of sheet steel in antique copper finish, is $4\frac{1}{2}$ x $3\frac{3}{4}$ inches greatest dimensions and 3 inches diameter at ends. The bank will receive and accurately register as dropped in American 5, 10 and 25 cent silver pieces (nickels, dimes and quarters), always showing in figures the total, as shown at left side. After \$5 has been registered the introduction of another coin relocks the door and the



Improved Three Coin Registering Savings Bank.

operation can be repeated. The coins are inserted in a horizontal slot at the upper right side of the small projecting lever, when the finger piece is pushed forward causing the coin to drop into the bank and register its value in a progressive total. A similar bank is also made to register 5, 10 and 25 cent Canadian silver pieces, which will also register the corresponding values in American coins, as well as the American 5-cent or nickel piece, regardless of the pronounced difference in size between Canadian silver and American nickel pieces. The registering mechanism can also be adapted to the coins of any foreign country. Each bank is put up in a cardboard box and packed six dozen in a case.

Combined Lock, Latch, Hasp and Staple.

The Kingsley Mfg. Company, Wallingford, Conn., manufacturer of hardware specialties, represented by Smith & Hemenway Company, 296 Broadway, New York, has recently put on the market the U-Run-No-Risk combination lock, latch, hasp and staple, here illustrated.

It is 7 inches long, made of wrought steel, bronzed, and is packed with two keys, screws and staples for immediate installation. It can be used on both swinging and sliding doors, and combines the advantages of a latch and hasp with that of a padlock, for profitable retailing



Combined Lock, Latch, Hasp and Staple.

at 30 to 35 cents each. There are six changes, the assortment being put up six on a display card, and a sample will be mailed to the trade on request.

Combined Salt Shaker and Pepper Grinder.

E. C. Fisher, 640 Broadway, New York, is now putting on the market the individual salt shaker and pepper grinder combined here illustrated. Fig. 1 reproduces the barrel-like bottom, known as 2 A, Fig. 2 showing another style with bell bottom, known as 2 B, the object of this construction being to provide in a single article receptacles for these two indispensable table accessories. The upper portion, Fig. 1, is glass, threaded at the bottom for engaging with the lower part, and holds table salt, the metal top, heavily plated, also screwing on. The lower compartment is designed for whole pepper and is filled at intervals by removing the top section, the capacity being enough to last a considerable time at the average rate of consumption. A hand made steel grinder

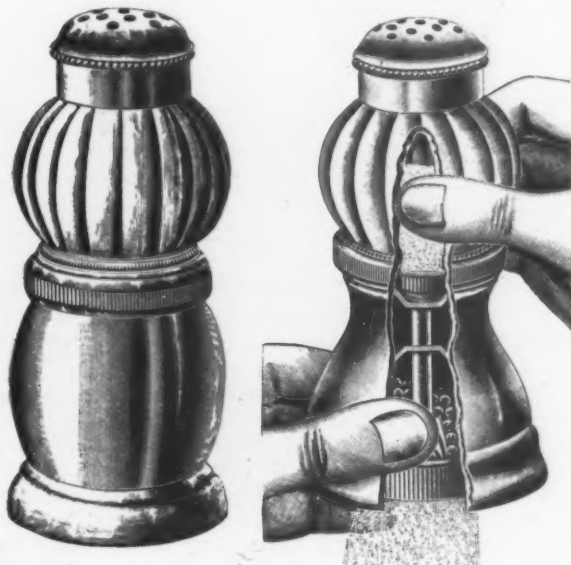


Fig. 1.—Salt Shaker and Pepper Grinder Combined. Fig. 2.—Showing Interior Mechanism and Process of Grinding Pepper.

is securely fitted on the bottom of the lower part, all of which is metal. There is a small brass nut at the upper end of the grinding member by which to regulate the degree of fineness in grinding, both salt and pepper being kept entirely separate from each other. The salt cap is of metal and screws directly onto the glass. The metal parts are either nickered or silver plated, according to price, and a third one of polished wood at bottom is made. In three or four weeks there will also be ready similar goods in both pressed and cut glass throughout. As shown in Fig. 2, partly cut away, pepper is ground as wanted by grasping the bottom with one hand and the upper portion with the other and revolving the section above. This ingenious device enables the user to season food at table with pure spice, not only free from adulteration, but fresh ground.

Porter's Meadow King Hay Carrier.

The accompanying cut represents Porter's new Meadow King hay carrier, which differs widely in many respects from other machines of this class. The most prominent of these new features is the manner in which the fork pulley is caught and held by the supporting dogs. In this carrier the dogs catch and hold the sheave or wheel of the fork pulley, thereby allowing the greatest range of adjustment with no friction on the supporting dogs, as the adjustment is obtained by the swinging of the pulley frame on the axle, while the sheave is perfectly motionless when in the carrier. The locking device is a positive force drop, and will work perfectly with the turn table of the carrier in any position. The carrier can



Porter's New Meadow King Hay Carrier.

be reversed either by pulling the rope through the carrier or by swiveling the turn table according to preference of operator. Material used in construction is the best malleable iron and steel. The axles are $\frac{7}{8}$ -inch turned steel, the rope sheaves have steel bushings and the fork pulley sheave, as well as its frame, is malleable and is protected from wear by a heavy steel bushing. In producing this new machine it has been the aim of the manufacturer, the J. E. Porter Company, Ottawa, Ill., to secure the highest beauty of design, good material and construction.

The Longden Magnetic Tack Hammer.

The magnetic tack hammer shown herewith has been added by the Arcade Mfg. Company, Freeport, Ill., to its line of hammers. The construction of the claw brings the fulcrum close to the lever, and in pulling it the handle be-



The Longden Magnetic Tack Hammer.

comes a powerful lever. The claw is formed so as to make it an excellent screw driver also. The company explains that the tempered head retains its magnetism permanently and that the hammer, on account of the many uses to which it can be put, is a valuable household tool.

The Bishop Automatic Saw Filer for Bevel Filing.

The accompanying illustration shows a saw filing device brought out by Geo. H. Bishop & Co., Lawrenceburg, Ind., for accurately filing saws. When in operation the saddle is slid on the clamp, keeping the tower always to the right. To bevel the side of a tooth the file is placed at the R. A. C. on the adjusting scale at the number corresponding to the number of teeth, the bevel guide at No. 2 to the right side mark, and the file fitted snugly in the gullet of tooth correctly at handle No. 3. The depth for the file to cut is obtained at No. 4, while for the left bevels the file is placed on the left side, also the bevel guide, the adjustment being the same as previously described. In

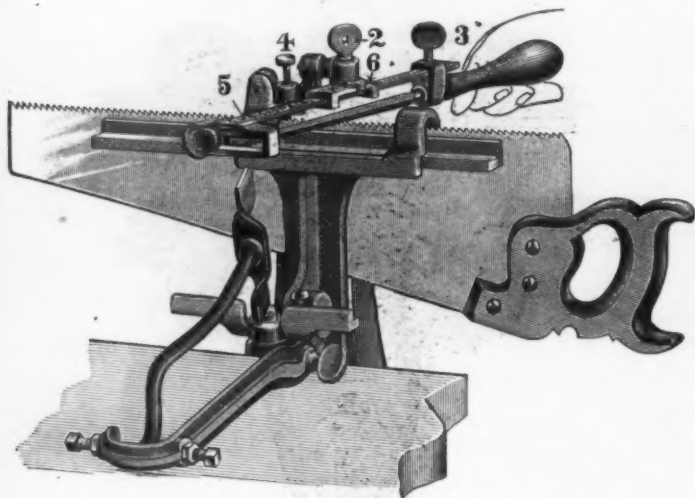


Fig. 1.—The Bishop Automatic Saw Filer for Bevel Filing.

operation the file is thrust through its full length and slightly lifted; when drawn back its full length it will be found in position to drop into the next tooth. For rip, band and butcher's saw filing, the tower is kept to the right and travels with the pitch of the tooth, not against it, using the upper scale and setting the file to correspond to the number of teeth, the guiding bar being set straight across the blade at the center mark, and screwed down firmly. The scale is spaced off for a $5\frac{1}{2}$ -inch file, but other sized files can be used as readily. The device is



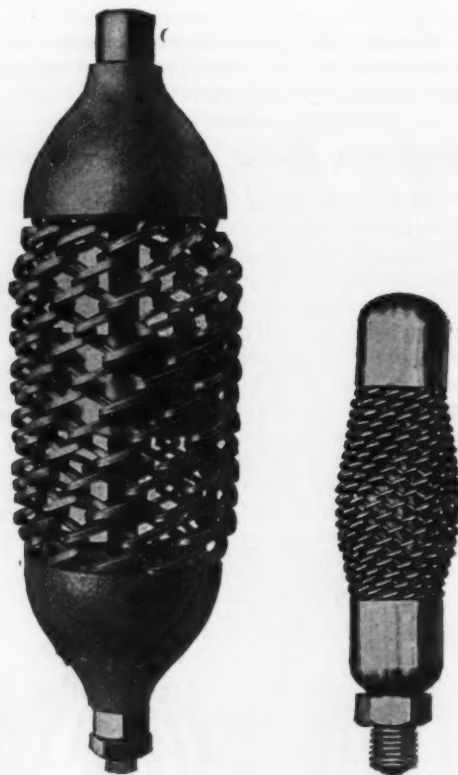
Fig. 2.—Adjusting Scale on Automatic Saw Filer.

put up in sets consisting of one automatic malleable enameled saw filer, one $5\frac{1}{2}$ -inch file, one hardwood file handle, and one 28-inch hardwood saw clamp, prepared to fasten on side by screws, the other side holding the saw firmly by squeeze bolts at each end. The set is packed in a neat paper box.

Criss Cross Flue and Gun Cleaners.

The tube cleaner shown herewith is designed for cleaning all types and sizes of boiler tubes. It consists of a cylinder of high grade, carbonated, heavy square steel wire, which has cutting edges on each side, so that the

cleaner works in both directions when pushed and pulled in the tube. The cylinder is held at either end by a cast iron cap, the two caps being connected by an interior rod, the whole securely held by check nuts. Within the cylinder is a cylindrical spring, which, together with the resiliency of the wire, permits the cutting edges to adapt themselves to variations in sizes of tubes, to any contortion of the tubes, and also to any raised surface in the interior of the tubes, as, for instance, welded joints or blisters. The crumbled scale is discharged from the cleaner when it is drawn back, as well as when it is pushed forward in the tube. It is stated that the cleaner will polish new tubes and restore the surface of such



Flue Cleaner.

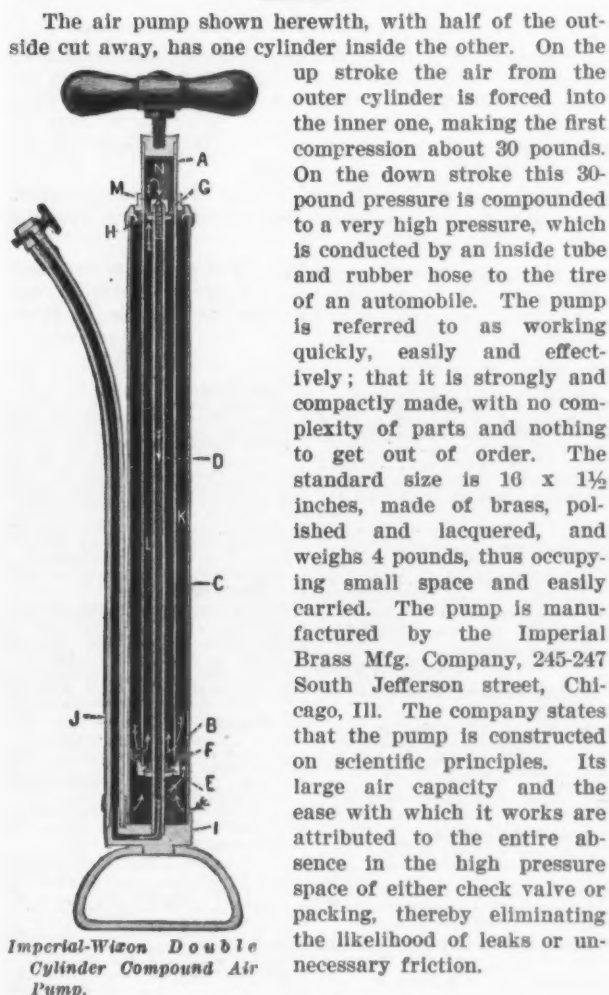
Gun Cleaner.

Criss Cross Flue and Gun Cleaners.

as have been defaced, as well as performing its chief function of removing scale and other foreign substances. The 3-inch cleaner has 90 cutting surfaces, or 180 cutting edges. It is made in sizes from $1\frac{1}{2}$ to 4 inches, in variations of $\frac{1}{4}$ inch; and $4\frac{1}{2}$, 5 and 6 inches. The same principle is embodied in the Criss-Cross sectional cleaner, made of heavy wire, with 200 cutting edges, surfaces, for cleaning out the various styles of sectional heaters. There are two sizes— $5\frac{1}{2}$ inches long, $3\frac{1}{2}$ inches wide and $1\frac{1}{4}$ inches thick, and $5\frac{1}{2} \times 3\frac{1}{8} \times 1$ inch. The gun cleaner, shown herewith, is a flexible, woven brass wire, seamless cylinder, held by a brass cap at either end and check nuts. The connecting rod, which holds the caps, is threaded on the end to fit any standard size cleaning rod. Elasticity is given the cylinder by a rubber cushion inclosing the rod. The cleaner can be pushed through the choked end and drawn back into the barrel. It touches all parts of the barrel surface. The cleaner is made in sizes to fit all gauges of shot guns and rifles. Both cleaners are manufactured by the Reversible Tube Cleaner Company, Worcester, Mass.

THE Hardware business of S. H. Davis & Co., 68-70 Portland street, Boston, has been incorporated as the S. H. Davis Company, with these officers: President, M. L. Davis; treasurer and secretary, E. L. Davis, and directors, these officers and C. H. Davis. The business was established in 1871 by S. H. Davis and M. B. Stebbins at 33 Sudbury street, part of the present store, S. H. Davis & Co. succeeding in 1896.

Imperial-Wixon Double Cylinder Compound Air Pump.

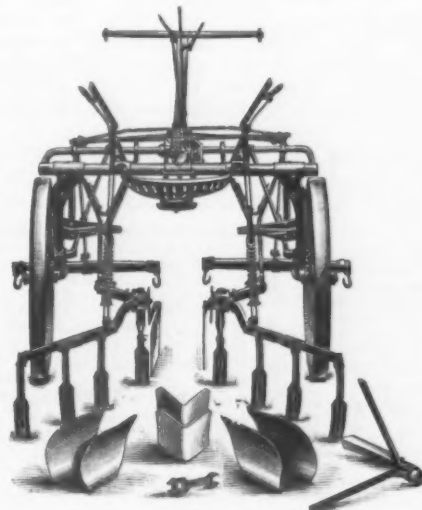


The air pump shown herewith, with half of the outside cut away, has one cylinder inside the other. On the up stroke the air from the outer cylinder is forced into the inner one, making the first compression about 30 pounds. On the down stroke this 30-pound pressure is compounded to a very high pressure, which is conducted by an inside tube and rubber hose to the tire of an automobile. The pump is referred to as working quickly, easily and effectively; that it is strongly and compactly made, with no complexity of parts and nothing to get out of order. The standard size is 16 x 1½ inches, made of brass, polished and lacquered, and weighs 4 pounds, thus occupying small space and easily carried. The pump is manufactured by the Imperial Brass Mfg. Company, 245-247 South Jefferson street, Chicago, Ill. The company states that the pump is constructed on scientific principles. Its large air capacity and the ease with which it works are attributed to the entire absence in the high pressure space of either check valve or packing, thereby eliminating the likelihood of leaks or unnecessary friction.

Planet, Jr., Two-Horse Pivot Wheel Riding Cultivator, Plow, Furrower and Ridger No. 74.

S. L. Allen & Co., Philadelphia, Pa., are offering the new riding cultivator shown in the accompanying cut. It is an improvement in construction over the firm's

No. 70 cultivator, but does the same work and has the same equipment. The adjustments are more easily made than those of the older machine, and although about the same weight this cultivator is stronger and more easily handled, while an all steel frame and tongue are among the improvements. A single lever operates the hinged tongue, regulating the depth of the front wheel and leveling the machine to suit all heights of neck yoke, while the same lever moves the gangs of teeth instantly, either



Planet, Jr., Two-Horse Pivot Wheel Riding Cultivator, Plow, Furrower and Ridger No. 74.

closer to or farther from the row, as desired. The equipment includes four pairs of cultivator teeth, one fallow tooth, two pairs of plows, a pair of furrowing teeth and a pair of improved plant guards. A pair of disk plows are supplied as an extra. Among the points of excellence are the following: The pivot wheels act instantly, the seat is large and comfortable, adjustable up and down, back and forth; the levers and springs regulate depth and pressure on the teeth; the arch is 33 inches high, clearing corn until 5 feet or more; it works rows from 28 to 44 inches, cultivating, plowing, hilling, &c., as desired; it marks out rows from 24 to 44 inches apart, two at a time, and with the plows will cover or make up drills. It is remarked that as a whole the machine combines more good points than any similar tool the firm has ever made and that it is guaranteed to be exactly as represented.

PAINTS, OILS AND COLORS

Animal, Fish and Vegetable Oils—

Linseed, City, raw.....	44	@45
Linseed, City, Boiled.....	45	@47
Linseed, State and West'n, raw.....	42	@43
Linseed, raw Calcutta seed.....	46	@45
Lard, Extra Prime, Winter.....	68	@69
Lard, Extra No. 1.....	48	@49
Lard, No. 1.....	38	@40
Cotton-seed, Crude, f.o.b. mills.....	24½	@25
Cotton-seed, Summer Yellow, Prime.....	31½	@32
Cotton-seed, Summer Yellow, off grades.....	28	@29
Sperm, Crude.....	48	@50
Sperm, Natural Spring.....	48	@50
Sperm, Bleached Spring.....	48	@50
Sperm, Natural Winter.....	61	@62
Sperm, Bleached Winter.....	64	@65
Tallow, Prime.....	51	@53
Whale, Crude.....	42	@44
Whale, Natural Winter.....	42	@44
Whale, Bleached Winter.....	44	@46
Menhaden, Brown, Strained.....	26	@28
Menhaden, Light, Strained.....	27	@30
Menhaden, Bleached, Winter.....	32	@33
Menhaden, Ex-Bld., Winter.....	34	@35
Menhaden, Southern.....	21	@22
Cocconut, Ceylon.....	10	@11
Cocconut, Cochín.....	7½	@7¾
Cod, Domestic, Prime.....	34	@35
Cod, Newfoundland.....	39½	@40
Red, Elaine.....	30	@31
Red, Saponified.....	57	@58
Olive, Italian, bbls.....	48	@49
Neatsfoot, prime.....	48	@49
Palm, Logos.....	64	@64½

Mineral Oils—

Black, 29 gravity, 25 cold test.....	10½	@11¼
Black, 29 gravity, 15 cold test.....	11½	@12¼
Black, Summer.....	10½	@11¼
Cylinder, light filtered.....	18	@19
Cylinder, dark filtered.....	18	@17
Paraffine, 903-807 gravity.....	12½	@13
Paraffine, 883 gravity.....	11½	@12
Paraffine, 883 gravity.....	9½	@9¾
Paraffine, Red.....	11½	@13

In small lots ¼¢ advance.

Miscellaneous—

Barytes:		
White, Foreign.....	100 lb	\$17.50@19.00
Amer. floated.....	100 lb	18.00@19.00
Off color, No. 2.....	100 lb	13.50@15.00
Chalk, in bulk.....	100 lb	3.50@3.75
Chalk, in bbls.....	100 lb	4.00
China Clay, English.....	100 lb	11.90@17.00
Cobalt, Oxide.....	100 lb	2.50@2.60
Whiting, Common.....	100 lb	.43@.44
Whiting, Gilders.....	100 lb	.50@.55
Whiting, Ex. Gilders.....	100 lb	.55@.60

Putty, Commercial—

In bladders.....	\$1.05	@1.25
In bbls. or tubs.....	1.15	@1.35
In 1 lb to 5 lb cans.....	2.60	@2.90
In 12½ to 50 lb cans.....	1.45	@1.85

Spirits Turpentine—

In Oil bbls.....	65½	@69
In machine bbls.....	69	@69½

Glue—

Cabinet.....	11	@15
Common Bone.....	7	@9
Extra White.....	18	@24
Foot Stock, White.....	11	@14
Foot Stock, Brown.....	8	@11
German Hide.....	12	@18
French.....	10	@40
Irish.....	13	@16
Low Grade.....	9	@12
Medium White.....	14	@17

Gum Shellac—

Bleached Commercial.....	38	@39
Bone Dried.....	49	@50
Button.....	42	@45
Diamond I.....	46	@50
A. C. Garne.....	43	@46
Fine Orange.....	43	@46
Octagon B.....	42	@46
T. N.....	45	@46
V. S. O.....	54	@55

Colors in Oil—

Black, Lampblack.....	12	@14
Blue, Chinese.....	38	@46
Blue, Prussian.....	32	@36

Blue, Ultramarine.....	13	@16
Brown, Vandyke.....	11	@14
Green, Chrome.....	10	@15
Green, Paris.....	21	@21
Sienna, Raw.....	12	@15
Sienna, Burnt.....	12	@15
Umber, Raw.....	11	@14
Umber, Burnt.....	11	@14

White Lead, Zinc, &c.—

Lead, English white, in Oil.....	9½	@9½
Lead, American white, in Oil:		
Lots of 500 lb or over.....	7½	@7½
Lots less than 500 lb.....	7½	@7½
In Barrels.....	6½	@6½
Lead, White, in oil, 25 lb tin		
pails, add to keg price.....	½	@½
Lead, White, in oil, 12½ lb tin		
pails, add to keg price.....	1	@1
Lead, White, in oil, 1 to 5 lb		
asn't tins, add to keg price.....	1½	@1½
Lead, American, Terms: For lots 12		
tons and over ¼¢ rebate; and 2% for		
cash if paid in 15 days from date of		
invoice; for lots of 500 lbs. and over		
2% for cash if paid in 15 days from		
date of invoice, for lots of less than		
500 lbs. net.....	6½	@6½
Lead, White, Dry, in bbls.....	4½	@5
Zinc, American, dry.....	4½	@5
Zinc, French:		
Paris, Red Seal, dry.....	9½	@10
Paris, Green Seal, dry.....	10½	@11
Antwerp, Red Seal, dry.....	8½	@9
Antwerp, Green Seal, dry.....	10	@11
Zinc, V. M. French, in Poppy Oil:		
Green Seal:		
Lots of 1 ton and over.....	12½	@13½
Lots of less than 1 ton.....	13½	@13½
Zinc, V. M. French, in Poppy Oil:		
Red Seal:		
Lots of 1 ton and over.....	11½	@12½
Lots of less than 1 ton.....	11½	@12½
Discounts—French Zinc—Discounts		
to buyers of 10 bbl. lots of one or mixed		
grades: 1% 25 bbls., 2% 50 bbls., 4%.		

Dry Colors—

Black, Carbon.....	5	@10
Black, Drop, American.....	4	@6
Black, Drop, English.....	5	@15
Black, Ivory.....	16	@20

Lamp, Com.....	4½	@6
Blue, Celestial.....	4	@6
Blue, Chinese.....	29	@32
Blue, Prussian.....	27	@30
Blue, Ultramarine.....	4½	@15
Brown, Spanish.....	½	@1
Carmine, No. 40.....	33.50	@36.00
Green, Chrome, ordinary.....	3½	@6
Green, Chrome, pure.....	17	@25
Lead, Red, bbls, ½ bbls. and kegs:		
Lots 500 lb or over.....	7½	@7½
Lots less than 500 lb.....	7½	@7½
Litharge, American, bbls.....	3	@4
Ocher, American.....	10	@16.00
Ocher, American Golden.....	2½	@3½
Ocher, French.....	1½	@2½
Ocher, Foreign Golden.....	3	@4
Orange Mineral, English.....	10	@12
Orange Mineral, French.....	10½	@12½
Orange, Mineral, German.....	8½	@10
Orange, Mineral, American.....	8½	@8½
Red, Indian, English.....	4½	@8½
Red, Indian, American.....	3	@3½
Red, Turkey, English.....	4	@10
Red, Tuscan, English.....	7	@10
Red, Venetian, Amer.....	100	\$0.50@1.25
Red Venetian, English.....	100	\$1.15@1.75
Sienna, Italian, Burnt and		
Powdered.....	3	@9½
Sienna, Ital. Raw Powd.....	3	@6½
Sienna, American, Raw.....	1½	@2
Sienna, American, Burnt and		
Powdered.....	1½	@2
Talc, French.....	10	\$15.00@30.00
Talc, American.....	10	\$15.00@25.00
Terra Alba, French.....	100	\$0.90@1.00
Terra Alba, English.....	100	\$0.90@1.00
Terra Alba, American.....	100	
Terra, No. 1.....	70	@80
Terra, No. 2.....	100	@100
Umber, Turkey, Bnt & Pow.....	2½	@3½
Umber, Turkey, Raw & Pow.....	2½	@3½
Umber, Burnt, Amer.....	1½	@2
Umber, Raw, Amer.....	1½	@2
Yellow Chrome.....	12	@14
Vermilion, American Lead.....	10	@25
Vermilion, Quicksilver, bulk.....	66	@66
Vermilion, Quicksilver, bbls.....	66	@66
Vermilion, English, Import.....	75	@80
Vermilion, Chinese.....	20.90	@1.00

Current Hardware Prices.

General Goods.—In the following quotations General Goods—that is, those which are made by more than one manufacturer—are printed in *Italics*, and the prices named, unless otherwise stated, represent those current in the market as obtainable by the fair retail hardware trade, whether from manufacturers or jobbers. Very small orders and broken packages often command higher prices, while lower prices are frequently given to larger buyers.

Special Goods.—Quotations printed in the ordinary type (Roman) relate to goods of particular manufacturers, who are responsible for their correctness. They usually represent the prices to the small trade, lower prices being obtainable by the fair retail trade, from manufacturers or jobbers.

Range of Prices.—A range of prices is indicated by means of the symbol @. Thus 33 $\frac{1}{2}$ %, @ 33 $\frac{1}{2}$ %, & 10% signifies

that the price of the goods in question ranges from 33 $\frac{1}{2}$ % per cent. discount to 33 $\frac{1}{2}$ % and 10 per cent. discount.

Names of Manufacturers.—For the names and addresses of manufacturers see the advertising columns and also THE IRON AGE DIRECTORY, issued May, 1905, which gives a classified list of the products of our advertisers and thus serves as a DIRECTORY of the Iron, Hardware and Machinery trades.

Standard Lists.—A new edition of "Standard Hardware Lists" has been issued and contains the list prices of many leading goods.

Additions and Corrections.—The trade are requested to suggest any improvements with a view to rendering these quotations as correct and as useful as possible to Retail Hardware Merchants.

Adjusters, Blind—

Domestic, $\frac{1}{2}$ doz. \$3.00.....33 $\frac{1}{2}$ %
North's.....10%
Zimmerman's—See Fasteners, Blind.

Window Stop—

Ives' Patent.....35%
Taplin's Perfection.....35%

Ammunition—See Caps, Cartridges, Shells, &c.

Anvils—American—

Eagle Anvils..... $\frac{1}{2}$ lb 6%
Hay-Budden, Wrought.....95%
Horseshoe brand, Wrought.....95%
Trenton..... $\frac{1}{2}$ lb 95%

Imported—

Peter Wright & Sons..... $\frac{1}{2}$ lb 10%
Anvil, Vise and Drill—

Millers Falls Co., \$18.00.....15%
Apple Parers—See Parers,

Apple, &c.

Aprons, Blacksmiths'—

Livingston Nail Co.....33 $\frac{1}{2}$ %

Augers and Bits—

Com. Double Spur.....75@75 $\frac{1}{2}$ %
Jennings' Patn., reg. finish.....50@50 $\frac{1}{2}$ %

Black Lip or Blued.....60@10%
Boring Mach. Augers.....70@10%
Car Bits, 12-in. twist.....50@10%
Ford's Auger and Car Bits.....40@5%
Forster Pat. Auger Bits.....35%
C. E. Jennings & Co.:
No. 10 ext. lip, R. Jennings' list.....25%
No. 30, R. Jennings' list.....40@75%
Russell Jennings.....25@10@25%
L'Hommedieu Car Bits.....45%
Mayhew's Countersink Bits.....50@50 $\frac{1}{2}$ %
Millers Falls.....50@50 $\frac{1}{2}$ %
Ohio Tool Co.'s Bailey Auger and Car Bits.....40@10%
Pugh's Black.....30%
Pugh's Jennings' Pattern.....35%
Snell's Auger Bits.....60%
Snell's Bell Hangers.....60%
Snell's Car Bits, 12-in. twist.....50@10%
Wright's Jennings' Bits.....50%

Bit Stock Drills—

See Drills, Twist.

Expansive Bits—

Clark's small, \$18; large, \$25.....50@10%
Clark's Pattern, No. 1, $\frac{1}{2}$ doz. \$35.....60%
Ford's, Clark's Pattern.....50@50 $\frac{1}{2}$ %
C. E. Jennings & Co., Steer's Pat. 25.....25%
Swan's.....60%

Gimlet Bits—

Common Dble. Cut.....\$3.00@3.25
German Pattern, Nos. 1 to 10, \$4.00; 11 to 15, \$5.75

Hollow Augers—

Bonney Pat., per doz. \$5.50@6.00
Ames.....25@10%
Universal.....30%
Wood's Universal.....25%

Ship Augers and Bits—

Ship Augers.....45@50@60%
Ford's.....35@65%
C. E. Jennings & Co.:
L'Hommedieu's.....15%
Watrous's.....35@65%
Ohio Tool Co.'s.....40%
Snell's.....45%

Awl Hfts—See Handles, Mechanics' Tool.

Awls—

Brad Awls:
Handled.....gro. \$2.75@3.00
Unhdd, Shldered.....gro. \$3.65@4.00
Unhanded, Patent.....gro. \$6.00@7.00

Peg Awls—

Unhanded, Patent.....gro. \$1.25@1.50
Unhdd, Shldered.....gro. \$5.00@6.00

Scratch Awls—

Handled, Com.....gro. \$3.50@4.00
Handled, Socket.....gro. \$11.50@12.00
Hurwood.....40%

Awl and Tool Sets—See Sets, Awl and Tool.

Axes—

Single Bit, base weights:
First Quality.....\$6.75
Second Quality.....\$6.25

Double Bit, base weights:
First Quality.....\$9.00
Second Quality.....\$8.50

Axle Grease—

See Grease, Axle

Axles—

Concord, Loose Collar.....\$4.00@4.50
Concord, Solid Collar.....\$4.50@5.00
No. 1 Common, Loose.....3%@3% $\frac{1}{2}$ %

No. 1 $\frac{1}{2}$ Com., New Style 3%@4% $\frac{1}{2}$ %

No. 2 Solid Collar.....40@45%

Half Patent:
Nos. 7, 8, 11 and 12.....75@75 $\frac{1}{2}$ %
Nos. 13 to 14.....70@10@75 $\frac{1}{2}$ %
Nos. 15 to 18.....75@10@75@10 $\frac{1}{2}$ %
Nos. 19 to 22.....75@10@75@10 $\frac{1}{2}$ %

Boxes, Axle—

Common and Concord, not turned lb. 4% $\frac{1}{2}$ %
Common and Concord, turned lb. 5% $\frac{1}{2}$ %
Half Patent.....lb. 8% $\frac{1}{2}$ %

Bait—

Hendryx:
A Bait.....20%
B Bait.....25%
Competitor Bait.....20@25%

Balances—

Caldwell new list.....50%
Pulman.....50@10@60%

Spring—

Spring Balances.....50@10@60%
Chatillon's:
Light Spg. Balances.....40@10%
Straight Balances.....40%
Circular Balances.....50%
Large Dial.....50%

Barb Wire—See Wire, Barb.

Bars—

Steel Crowbars, 10 to 40 lb. per lb., 3% $\frac{1}{2}$ %

Towel—

No. 10 Ideal, Nickel Plate.....gro. \$8.50

Beams, Scale—

Scale Beams.....40@10@50%
Chatillon's No. 1.....30%
Chatillon's No. 2.....40%

Beaters, Carpet—

Holt-Lyon Co.:
No. 12 Wire Coppered $\frac{1}{2}$ doz. \$8.85;
Tinned.....\$1.00
No. 11 Wire Coppered $\frac{1}{2}$ doz. \$1.10;
Tinned.....\$1.20
No. 10 Wire Galvanized.....\$1.75
Western W. G. Co.:
No. 1 Electric.....gro. \$7.80
No. 2 Buffalo.....gro. \$9.00
No. 3 Perfection Dust.....gro. \$8.00

Egg—

Holt-Lyon Co.:
Holt, No. A, Japanned..... $\frac{1}{2}$ doz. \$1.20
Holt, No. 1, Tinned..... $\frac{1}{2}$ doz. \$1.50
Holt, No. B, Japanned..... $\frac{1}{2}$ doz. \$2.00
Holt, No. 2, Tinned..... $\frac{1}{2}$ doz. \$2.25
Lyon, No. 2, Japanned..... $\frac{1}{2}$ doz. \$1.25
Lyon, No. 3, Japanned..... $\frac{1}{2}$ doz. \$1.50
Taplin Mfg. Co.:
No. 60 Improved Dover.....\$5.00
No. 75 Improved Dover.....\$6.50
No. 100 Improved Dover.....\$7.00
No. 102 Improved Dover, Tin'd.....\$8.50
No. 150 Improved Dover, Hotel.....\$15.00
No. 152 Imp'd Dover, Hotel, T'd.....\$17.00
No. 200 Imp'd Dover, Tumbler.....\$8.50
No. 202 Imp'd Dover Tumbler, T'd.....\$9.50
No. 300 Imp'd Dover Mammoth.....\$25.00
Western W. G. Co., Buffalo.....\$7.00
Wonder (R. M. Co.).....gro. net, \$6.00

Bellows—

Blacksmith, Standard List.....60@10@70@10%

Hand—

Inch. 6 7 8 9 10
Dox. \$4.75 5.70 6.65 7.60 8.85

Molders—

Inch. 9 10 11 12 14
Dox. \$8.00 9.00 10.50 12.50 14.50

Bells—

Ordinary goods.....75@5@75@10@5%
High grade.....70@10@70@10@5%
Jersey.....75@5%
Texas Star.....50%

Door—

Abbe's Gong.....45%
Burton Gong.....50%
Home, R. & E. Mfg. Co.'s.....55@10%
Lever and Pull, Sargent's.....60@10@10%
Trip Gong.....50@10@50@10@5%
Yankee Gong.....55%

Hand—

Hand Bells, Polished Brass.....60@10%
White Metal.....60%
Nickel Plated.....50@10@60%
Sticks.....60@10@75%
Cone's Globe Hand Bells.....33@25%
Silver Chime.....33@35%

Miscellaneous—

Farm Bells.....lb. 2% $\frac{1}{2}$ %
Steel Alloy Church and School.....50@10@60%
American Tube & Stamping Co. Gongs.....75%
Table Call Bells.....50@50@10%

Belting—Leather—

Extra Heavy, Short Lap.....60@5%
Regular Short Lap.....60@10@5%
Standard.....70%
Light Standard.....70@5%
Cut Leather Lacing.....50%
Leather Lacing Sides, per sq. ft. 25%

Rubber—

Agricultural (Low Grade).....75@75@5%
Common Standard.....70@70@10%
Standard.....60@5@10@10%
Extra.....60@10@5%
High Grade.....50@5@50@10%

Bench Stops—

See Stops, Bench

Benders and Upsetters, Tire—

Detroit Perfected Tire Bender.....40%
Detroit Stoddard's Lightning Tire Upsetters, No. 1, \$4.25; No. 2, \$7.25; No. 3, \$10.50; No. 4, \$16.25; No. 5, \$20.50.
Green River Tire Benders and Upsetters.....20%

Bicycle Goods—

John S. Leng's Son's 1902 List:
Chain.....50%
Parts.....50%
Spokes.....50%
Tubes.....60%

Bits—

Auger, Gimlet, Bit Stock Drills, &c.—See Augers and Bits.

Blocks—Tackle—

Common Wooden.....70@10@75%
Hartz St. Tackle Blocks.....50@50@5%
B. & L. B. Co.:
Boston Wood Snatch, 50%; Eclipse Steel 75%; Hollow Steel, 50@10%
Star Wire Rope, 50%; Tarbox Metal Snatch, 50%; Tarbox New Style Steel, 50@10%; Wire Rope Snatch, 50%
Lane's Patent Automatic Lock and Junior Wood Snatch, 50%
Stowell's Novelty, Mal. Iron.....50@10%
Stowell's Self Loading.....60%
See also Machines, Hoisting.

Boards, Stove—

Zinc, Crystal, &c.....30@19@40@10%

Boards, Wash—

See Washboards.

Bobs, Plumb—

Keuffel & Esser Co.....33@35%

Bolts—

Carriage, Machine, &c.—Common Carriage (cut thread):
% 2 & smaller.....75@%
Larger and Longer.....65@50%
Phila. Eagle \$5.00 list May 21, '99

Bolt Ends, list Feb. 14, '95.....80%

Machine, $\frac{1}{2}$ & 4 and smaller.....65@10@%

Machine, larger and longer.....65@10@%

Door and Shutter—

Cast Iron Barrel, Japanned, Round Brass Knob:
Inch. 3 4 5 6 8
Per doz. \$9.30 35 45 60 80

**Cast Iron Spring Foot, Jap'd:
Inch. 6 8 10
Per doz. \$1.20 1.50 2.25**

**Cast Iron Chain, Flat, Japanned:
Inch. 6 8 10
Per doz. \$1.00 1.40 1.65**

**Cast Iron Flat Shutter, Jap'd,
Brass Knobs:
Inch. 6 8 10
Per doz. \$0.75 35 1.25**

Wrt Barrel Jap'd.....80@80@10%

Wrt "Bronzed".....50@50@10%

Wrt Spring.....70@10@70@10@10%

Wrt Shutter.....50@5@50@10@5%

Wrt Square Neck.....75@75@10%

Wrt Square.....65@10@65@10@10%

Ires' Patent Door.....60%

Plow and Stove—

Plow.....65@10@10@70%

Stove.....87@10@%

Tire—

Norway Iron.....80%

Norway Iron.....80%

American Screw Company:
Norway Phila, list Oct. 16, '84.....80%
Eagle Phila, list Oct. 16, '84.....80%
Bay State, list Dec. 28, '99.....80%

Franklin Moore Co.:
Norway Phila., list Oct. 16, '84.....80%
Eagle Phila., list Oct. 16, '84.....80%
Eclipse, list Dec. 28, '99.....80%
Mount Carmel Bolt Co.:
Norway Phila., list Oct. 16, '84.....80%
Eagle Phila., list Oct. 16, '84.....80%
Mount Carmel, list Dec. 28, '99.....80%
Russell, Burdall & Ward Bolt & Nut Co.:
Empire, list Dec. 28, '99.....80%
Norway Phila., list Oct. 16, '84.....80%
Upon Nut Co.:
Tire Bolts.....72 $\frac{1}{2}$ %

Borers, Tap—

Borers Tap, Ring, with Handle:
Inch. 1 $\frac{1}{2}$ 1 $\frac{1}{2}$ 1 $\frac{1}{2}$ 2
Per doz. \$4.80 5.60 6.40 8.00

Enterprise Mfg. Co., No. 1, \$1.25; No. 2, \$1.65; No. 3, \$2.50 each.....25%

Boxes, Mitre—

C. E. Jennings & Co.....30%
Langdon.....15@10%
Perfection.....40%
Seavey.....33 $\frac{1}{2}$ %
Stanley R. & L. Co.:
Nos. 240 to 460.....30%
Nos. 50 and 60.....35%

Braces—

Common Ball, American.....\$1.25@1.30
Barber's.....50@10@10@10%
Fray's Genuine Spofford's.....60%
Fray's No. 70 to 120, 81 to 123, 207 to 414.....60%
C. E. Jennings & Co.....50@5%
Mayhew's Hatchet.....50%
Mayhew's Quick Action Hay Pat. 50
Millers Falls Drill Braces.....25@10%
P. S. & W. Co., Peck's Pat. 60@65%
Stanley R. & L. Co.:
Stanley.....35%
Victor.....45%

Brackets—

Wrought Steel.....80@10@80@10@5%
Griffin's Pressed Steel.....80@80@10%
Griffin's Folding Brackets.....70@10%
Stowell's Cast Shelf.....75%
Stowell's Sink.....50%
Western W. G. Co., Wire.....60@10%

Bright Wire Goods—

See Wire and Wire Goods.

Broilers—

Kilbourne Mfg. Co.....75@20%
Western W. G. Co.....80%
Wire Goods Co.....70@75@10%

Buckets, Galvanized—

Price per dozen:
Quart.....19 12 14
Water, Regular.....1.40 1.70 1.90
Water, Heavy.....3.40 3.70 3.80
Fire, Rd. Bottom.....2.30 2.55 2.95
Well.....2.55 2.87 3.15

Bucks, Saw—

Hoosier..... $\frac{1}{2}$ gro. \$36.00

Bull Rings—See Rings, Bull

Butts—Brass—

Wrought, list, Sept., '96, 15@%
Cast Brass, Tiebout's.....50%

Cast Iron—

Fast Joint, Broad.....40@10@50%
Fast Joint, Narrow.....40@10@50%
Loose Joint.....70@10@75%
Loose Pin.....70@10@75%
Mayer's Hinges.....70@70@45%
Parliament Butts.....70@70@45%

Wrought Steel—

Table and Back Flaps.....75%
Narrow and Broad.....75%
Inside Blind.....75%
Loose Pin.....75%
Loose Pin, Jap'd.....70@10%
Loose Pin, Ball and Steeple Tip.....85%
Japanned Ball Tip Butts.....70@10%

Bronzed, Wrt., Nar. and Inside Blind Butts.....55@10%

Cages, Bird—

Hendryx, Brass:
3000, 5000, 1100 series.....50%
1200 series.....33 $\frac{1}{2}$ %
200, 300, 600 and 900 series.....40@10%
Hendryx, Bronze:
700, 800 series.....40@10%
Hendryx, Enamelled.....40@10%

Calipers—See Compasses.

Calks, Toe and Heel—

Blunt, 1 prong.....per lb. 14@14%
Sharp, 1 prong.....per lb. 14@14%
Burke's Blunt.....40@45%
Burke's Sharp.....40@45%

Gautier, Blunt.....46¢
Gautier, Sharp.....46¢
Perkins, Blunt Toe.....46¢
Perkins, Sharp Toe.....46¢

Can Openers—

See Openers, Can.

Cans, Milk—

Illinois Pattern.....1.35 1.85 2.05 each.
New York Pattern.....1.50 2.20 2.45 each.
Baltimore Pattern.....1.50 2.20 2.45 each.
Dubuque.....1.35 1.60 1.75 each.

Cans, Oil—

Buffalo Family Oil Cans:
3 5 10 gal.
\$18.00 60.00 125.00 gro., net.

Caps, Percussion—

Eley's E. B.....52¢
G. D.....per M 34¢
F. L.....per M 40¢
G. L.....per M 48¢
Musket.....per M 62¢

Primers—

Berdan Primers, \$2 per M.....90¢
B. L. Caps (Sturtevant Shells)
\$2 per M.....90¢
All other primers per M \$1.50 @ 1.60

Cartridges—

Blank Cartridges:
32 C. F., \$5.50.....10¢
35 C. F., \$7.00.....10¢
22 cal. Rim, \$1.50.....10¢
32 cal. Rim, \$2.75.....10¢
B. B. Caps, Con. Ball, Svogd.....\$1.40
B. B. Caps, Round Ball.....\$1.40
Central Fire.....25¢
Primer and Sporting Rifle.....15¢
Primed Shells and Bullets.....15¢
Rim Fire, Sporting.....50¢
Rim Fire, Military.....15¢

Castors—

Bed.....70¢
Plate.....60¢
Philadelphia.....75¢
Acme, Ball Bearing.....33¢
Boss.....70¢
Boss Anti-Friction.....70¢
Gem (Roller Bearing).....80¢
Martin's Patent (Rhenish).....45¢
Standard Ball Bearing.....45¢
Tucker's Patent low list.....30¢
Yale (Double Wheel) low list.....50¢

Cattle Leaders—

See Leaders, Cattle.

Chain, Coil—

American Coil, Straight Link:
5-16 1/4 5-16 3/4 7-16 1/2 9-16 1/2
\$3.70 5.90 4.95 4.20 4.05 3.95 3.90
3/8 3/4 1/2 to 1 1/4 to 1 1/2 inch.
\$3.85 3.70 3.65 3.80
German Coil.....40¢ @ 10¢ @ 70¢

Halter—

Halter Chain.....60¢
German Pattern Halter Chain
list July 21, '97.....60¢ @ 10¢ @ 10¢
Covert Mfg. Co.....35¢
Halter.....35¢
Covert's Saddlery Works.....70¢
Halter.....70¢

Cow Ties—

See Halters and Ties.

Trace, Wagon, &c.—

Traces, Western Standard: 100 pr.
6 1/2-6 3/4, Str'ght, with ring, \$25.00
6 1/2-6 3/4, Str'ght, with ring, \$26.00
6 1/2-8 1/2, Str'ght, with ring, \$30.00
6 1/2-10 1/2, Str'ght, with ring, \$35.00
NOTE—Add 2c per pair for Hooks.
Teist Traces 2c per pair higher than
Straight Link.
Eastern Standard Traces, Wag-
on Chain, &c.....60¢ @ 10¢

Miscellaneous—

Jack Chain, list July 10, '93:
Iron.....60¢ @ 10¢ @ 70¢
Brass.....60¢ @ 10¢ @ 10¢
Safety Chain.....75¢ @ 75¢ @ 10¢
Gal. Pump Chain.....10¢ @ 10¢ @ 10¢
Covert Mfg. Co.:
Breast, Halter, Heel, Rein, Stal-
lion.....40¢
Covert Sadd. Works:
Breast, Hold Back, Rein.....70¢
Oueda Community:
Am. Dog Leads and Kennel Chains,
Niagara Dog Leads and Kennel
Chains.....45¢ @ 60¢ @ 5¢
Wire Goods Co.:
Dog Chain.....70¢ @ 10¢
Universal Dbl.-Jointed Chain.....50¢

Chain and Ribbon, Sash—

Oueda Community:
Copper Chain.....60¢
Steel Chain.....60¢
Pullman:
Bronze Chain.....60¢
Steel Chain.....60¢
Sash Chain Attachments, per set, 8¢
Aluminum Sash Ribbon, per 100
ft.....\$1.25 @ \$3.00
Sash Ribbon Attachments, per set, 8¢

Chalk—(From Jobbers.)

Carpenters' Blue.....gro. 38¢ @ 10¢
Carpenters' Red.....gro. 33¢ @ 35¢
Carpenters' White.....gro. 23¢ @ 30¢
See also Crayons.

Checks, Door—

Bardley's.....45¢
Eclipse.....60¢ @ 10¢
Pullman, per gro.....\$4.00
Russwin.....40¢

Chests, Tool—

American Tool Chest Co.:
Boy's Chests, with Tools.....55¢
Youth's Chests, with Tools.....40¢
Gentlemen's Chests, with Tools.....30¢
Farmers' Carpenters', etc., Chests,
with Tools.....20¢
Machinists' and Pipe Fitters'
Chests, Empty.....50¢
Tool Cabinets.....30¢
C. E. Jennings & Co.'s Machinists'
Tool Chests.....33¢ @ 10¢

Chisels—**Socket Framing and Firmer**

Standard List.....75¢ @ 75¢ @ 10¢
Buck Bros.....30¢
Charles Buck.....30¢
C. E. Jennings & Co. Socket Firmer
No. 10.....60¢
C. E. Jennings & Co. Socket Fram-
ing No. 15.....60¢
Ohio Tool Co.'s.....70¢
Swan's.....75¢
L. & I. J. White.....30¢ @ 30¢
L. & I. J. White, Tanged.....25¢ @ 5¢

Tanged—

Tanged Firmers.....33 1/3-34¢
Buck Bros.....30¢
Charles Buck.....30¢
C. E. Jennings & Co. Nos. 191, 181, 25¢

Cold—

Cold Chisels, good quality.....13¢ @ 15¢
Cold Chisels, 1 1/2 quality.....11¢ @ 12¢
Cold Chisels, ordinary.....9¢ @ 10¢

Chucks—

Almond Drill Chucks.....35¢
Almond Turret Six-Tool Chuck.....35¢
Beach Pat., each \$8.00.....35¢
Empire.....25¢
Blacksmiths'.....25¢
Jacobs' Drill Chucks.....25¢
Pratt's Positive Drive.....25¢
Skinner Patent Chucks.....25¢
Independent Lathe Chucks.....50¢
Universal.....50¢
Combination.....50¢
Drill Chucks, New Model.....50¢
Drill Chucks, Standard.....50¢
Drill Chuck, Skinner Pat., all sizes.....50¢
Drill Chucks, Positive Drive.....30¢
Planer Chucks.....25¢
Face Plate Jaws.....40¢
Standard Tool Co.:
Improved Drill Chuck.....45¢
Union Mfg. Co.:
Czar Drill.....35¢
Combination Geared Scroll.....40¢
Geared Scroll.....40¢
Independent.....50¢
Independent Steel.....40¢
Union Drill.....50¢
Universal.....50¢
Independent Iron F. Plate Jaws.....40¢
Independent Steel F. Plate Jaws.....40¢
Westcott Patent Chucks:
Lathe Chucks.....50¢
Little Giant Auxiliary Drill.....50¢
Little Giant Double Grip Drill.....50¢
Little Giant Drill, Improved.....50¢
Oneida Drill.....50¢
Scroll Combination Lathe.....50¢

Clamps—

Adjustable, Hammers.....20¢ @ 20¢ @ 5¢
Cabinet, Sargent's.....50¢ @ 10¢
Carriage Makers', P. S. & W.
Co.....40¢ @ 10¢ @ 50¢
Carriage Makers', Sargent's.....40¢
Beck's Parallel.....33¢ @ 10¢
Lineman's, Utica Drop Forge & Tool
Co.....40¢
Wood Workers, Hammers.....40¢ @ 10¢
Saw Clamps, see Vises, Saw Filers.....60¢

Cleaners, Drain—

Iwan's Champion, Adjustable.....55¢
Iwan's Champion, Stationary.....47¢

Sidewalk—

Star Socket, All Steel.....\$9 doz. \$4.05 net
Star Shank, All Steel.....\$9 doz. \$3.24 net
W. & C. Shank, All Steel.....\$9 doz.,
7 1/2 in., \$3.00; 8 in., \$3.25

Cleavers, Butchers'—

Foster Bros.....30¢
New Haven Edge Tool Co.'s.....45¢
Payette B. Plumb.....33¢ @ 33¢ @ 10¢
L. & I. J. White.....30¢

Clippers, Horse and**Sheep—**

Chicago Flexible Shaft Company:
Chicago Horse, each.....\$3.75
1902 Chicago Horse, each.....\$10.75
20th Century Horse, each.....\$5.00
Lightning Belt Horse, each.....\$15.00
Chicago Belt Horse, each.....\$20.00
Stewart's Enclosed Gear
Horse, each.....\$4.75
Stewart's Patent Sheep Shear-
ing Machine, each.....\$12.75

Clips, Axle—

Regular Styles, list July 1, '05.80¢
Cloth and Netting, Wire
—See Wire, &c.—

Cocks, Brass—

Hardware list:
Compression, Plain Bibbs,
Globe, Kerosene, Racking,
&c. Cocks.....75¢ @ 75¢ @ 4¢

Coffee Mills—

See Mills, Coffee.

Collars, Dog—

Nickel Chain, Walter B. Stevens &
Son's list.....40¢
Leather, Walter B. Stevens & Son's
list.....40¢

Combs, Curry—

Metal Stamping Co.....40¢

Mane and Tail—

Covert's Saddlery Works.....60¢ @ 10¢

Compasses, Dividers, &c.—

Ordinary Goods.....75¢ @ 75¢ @ 10¢
Bemis & Call Hdw. & Tool Co.:
Dividers.....65¢
Calipers, Double.....65¢
Calipers, Inside or Outside.....65¢
Calipers, Wing.....65¢
Compasses.....50¢
Wm. Schollhorn Co.:
Excelsior Dividers.....60¢
Lodi Dividers.....75¢

Conductor Pipe—

L. C. L. to Dealers:

Territory: Galvanized

Galv. Charcoal

Steel Iron Copper

Eastern:

70¢ @ 10¢ 60¢ @ 7 1/2¢ 50¢

Central:

70¢ @ 2 1/4¢ 60¢ 40¢ @ 10¢ @ 5¢

Western and S. W.:

65¢ @ 10¢ 50¢ @ 10¢ @ 2 1/4¢ 47 1/2¢

So. Western:

62 1/2¢ @ 7 1/2¢ 50¢ @ 5¢ 40¢ @ 10¢

Copper.

Eastern.....14¢ @ 16¢
Central.....50¢ @ 10¢
Southern.....50¢ @ 10¢
So. Western.....50¢ @ 2 1/4¢
Terms, 60 days; 2% cash 10 days. Fac-
tory shipments generally delivered.
See also Eave Troughs.

Coolers, Water—

Gal. each.....2 3 4 6 8
Labrador.....\$1.20 \$1.50 \$1.80 \$2.10 \$2.70
Gal.....3 4 6 8
Iceland, ea.....\$1.80 \$2.10 \$2.40 \$3.00
Gal.....2 3 4 6 8
Galvanized, ea.....\$1.85 \$2.00 \$2.25 \$2.90 \$3.90
Galvanized, Lined, side handles,
Gal.....2 3 4 6 8
Each.....\$1.95 \$2.15 \$2.40 \$3.30 \$4.15
White Enamelled.....25¢
Agate Lined.....25¢

Coopers' Tools—

See Tools, Coopers'.

Coppers' Soldering—

Soldering Coppers, 3 lbs. to pair
and heavier, 23¢ @ 24¢; lighter
than 3 lbs. to pair.....25¢ @ 26¢

Cord—

Braided, Drab.....lb. 35¢
Braided, White, Com., Nos. 8
to 12, 24¢; No. 7, 24 1/2¢; No. 6,
25 1/2¢

Cable Laid Italian.

lb., A, 18¢; B, 16¢

Common India.....lb. 10¢ @ 10 1/2¢

Cotton Sash Cord, Twisted, 17¢ @ 19¢

Patent Russia.....lb. 11¢

Cable Laid Russia.....lb. 11¢

India Hemp, Braided, lb. 11¢

India Hemp, Twisted, lb. 12¢ @ 13¢

Patent India, Twisted, lb. 12¢ @ 13¢

Annisson Cordage Co.: 50 ft., 50¢

Oriele, 50 ft., Columbia, \$0.85;

50 ft., Victors, \$1.00; 50 ft., 6-Thread,

\$1.10; 60 ft., 3-Thread, \$0.95; 60 ft.,

Manila, \$1.40; 60 ft., Jute, \$0.75.

Pearl Braided, cotton, No. 8, 9, 10,

24 1/2¢; No. 7, 23 1/2¢; Nos. 8 to 12, 23¢

Eddystone Braided, Nos. 8, 9 and

10, 25¢; 7, 25 1/2¢; 6, 26 1/2¢.

Harmony Cable Laid Italian, Nos. 7

to 10.....\$12 23¢

Peelless:

Cable Laid Italian.....16¢

Cable Laid Russian.....14¢

Cable Laid India.....12¢

Braided India.....18¢

Pullman:

Wire Sash Cord.....10¢

Sash Cord Attachments, per doz. 10¢

Sargent, Nos. 8, 12, 3¢

Braided, Drab Cotton.....\$9 40¢

Braided, Italian Hemp.....\$9 40¢

Braided, Linen.....\$9 55¢

Braided, White Cotton or Spot.....\$9 35¢

Massachusetts, White.....\$9 30¢

Manchushev, Drab.....\$9 35¢

Phoenix, White, Nos. 8 to 12, 27¢;

No. 7, 27 1/2¢; No. 6, 28 1/2¢.

Silver Lake:

A, Drab.....45¢

A, White.....40¢

B, Drab.....40¢

B, White.....35¢

Indian Hemp.....10¢

Linen.....57 1/2¢

See also Chain and Ribbon.

Wire, Picture—

List Oct., '00.....85¢ @ 10¢ @ 85¢ @ 10¢ @ 10¢ @ 5¢

Hendryx Standard Wire Picture Cord,
85¢ @ 10¢

Cradles—

Grain.....40¢ @ 12 1/2¢

Crayons—

White Round Crayons, gr. 6 @ 6 1/2¢

Cases, 100 gro., \$5.00 at factory.

D. M. Stewart Mfg. Co.:
Genuine.....Per gro.

Round Pencil, \$2.25; Square Pen-
cil, \$1.75; Flat Crayon, \$2.50;

Metal Workers' Crayon, \$3.00;

Rolling Mill Crayon, \$3.00.

Compo. Per gro.

Round Pencil, \$1.50; Square Pen-
cil, \$1.50; Flat Crayon, \$1.50;

Metal Workers' Crayon, \$2.50;

Rolling Mill Crayon, \$2.50;

Railroad Crayon, \$4.00; Compo.
Crayon, \$4.00.

Zelnicke's Lumber:
Red, Blue, Green.....\$9 gro. \$6.50

Black.....\$9 gro. \$4.00

See also Chalk.

Crooks, Shepherd's—

Fort Madison, Heavy.....\$9 doz. \$7.00

Fort Madison, Light.....\$9 doz. \$6.50

Crow Bars—See Bars, Crow.**Cultivators—**

Victor Garden.....50¢

Cutlery Table

International Silver Company:
No. 12 M'd'm Knives, 1817, \$9 doz. \$3.50

Star, Eagle, Rogers & Hamilton
and Anchor.....\$9 doz. \$3.00

Wm. Rogers & Son.....\$9 doz. \$2.50

Cutters—Glass—

H. H. Mayhew Co.....40¢

Red Devil.....50¢

Smith & Hemenway Co.....50¢

Woodward.....40¢

Meat and Food—

American.....30¢

Noch.....\$5 \$7 \$10 \$25 \$50 \$60

Enterprise.....25¢ @ 25¢ @ 7 1/2¢

Each.....5 10 12 22 32

Dixon's.....\$2 \$3 \$2.75 \$4.50 \$6

No.....\$9 doz. 40¢ @ 50¢

Ideal.....\$14.00 \$17.00 \$19.00 \$30.00

Little Giant.....40¢ @ 10¢ @ 50¢

Nos.....305 310 312 320 322

N. E. Food Choppers.....\$35.00 \$40.00 \$44.00 \$72.00 \$98.00

New Triumph No. 605, \$9 doz. \$24.00

Russwin Food, No. 1, \$21.00; No. 2,
\$27.00.....45¢ @ 10¢ @ 10¢
Woodruff's.....\$9 doz. 40¢ @ 50¢
Nos.....100 150
Enterprise Beef Shavers.....25¢ @ 30¢

Slaw and Kraut—

Henry Dinston & Sons:
Slaw, Corn Grater, &c.....40¢
Kraut Cutters, 21 x 7, 20 x 8, 30
x 9.....55¢
Kraut Cutters, 36 x 12, 40 x 12.....40¢
J. M. Mast Mfg. Co.:
Slaw Cutters, 1 Knife.....\$9 doz. \$3.00
Combined Slaw Cutter and Corn
Grater.....\$9 doz. \$4.00
Tucker & Dorsey Mfg. Co.:
Kraut Cutters.....40¢
Slaw Cutters, 1 Knife.....\$9 gr. \$18 @ \$20
Slaw Cutters, 2 Knife.....\$9 gr. \$22 @ \$24

Tobacco—

All Iron, Cheap.....doz. \$4.25 @ \$4.50
Enterprise.....25¢ @ 30¢
National, \$9 doz., No. 1, \$21; No. 2,
\$18.....40¢
Sargent's, \$9 doz., No. 2, 21.....60¢ @

1/4 Keys....lb. 5 1/2¢ 6¢ 4¢
 10-lb. cans....6 1/2¢ 7¢ 6¢
 10-lb. cans, less
 than 10....10¢ 10¢ 8¢
 Less quantity .10¢ 10¢ 8¢
 NOTE.—In lots 1 to 3 tons a discount
 of 10% is given.

Extractors, Lemon Juice
 —See Squeezers, Lemon.

Fasteners, Blind—
 Zimmerman's.....50¢10%
 Walling's.....40¢10%

Cord and Weight—
 Ives.....40%

Faucets—
 Cork Lined.....50¢50¢10%
 Metallic Key, Leather Lined.....
 60¢10¢70%
 Red Cedar.....40¢10¢50%
 Petroleum.....70¢10¢75%
 B. & L. B. Co.:.....60¢10%

Star.....60%
 West Lock.....50¢10%
 John Sommer's Peerless Tin Key.....40%
 John Sommer's Boss Tin Key.....50%
 John Sommer's Victor Mtl. Key.....50¢10%
 John Sommer's Duplex Metal Key.....40%
 John Sommer's Diamond Lock.....50%
 John Sommer's I. X. L. Cork Lined.....40%
 John Sommer's Reliable Cork Lined.....50%
 John Sommer's Chicago Cork Lined.....50%
 John Sommer's O. K. Cork Lined.....50%
 John Sommer's No Brand, Cedar.....50%
 John Sommer's Perfection, Cedar.....40%
 McKenna, Brass:

Burglar Proof, N. P.....25%
 Improved, 1/2 and 1/4 inch.....25%
 Self Measuring.....40%
 Enterprise, 1/2 doz. \$36.00.....40¢10%
 Lane's, 1/2 doz. \$36.00.....40¢10%
 National Measuring, 1/2 doz. \$36.00.....40¢10%

Felloe Plates—
 See Plates, Felloe.

Files—Domestic—

List revised Nov. 1, 1899.
 Best Brands.....70¢10¢75¢10%
 Standard Brands.....75¢10¢75¢10%
 Lower Grade.....75¢10¢10¢80¢10%

Imported
 Stubs' Tapers, Stubs' Ltd, July
 24, '97.....33¢1-3¢40%

Fixtures, Fire Door—
 Richards Mfg. Co.:.....37.75
 Universal, No. 103.....37.75
 Special, No. 104.....37.75
 Fusible Links, No. 98.....60%
 Expansion Bolts, No. 107.....60¢10%

Grindstone—

Net Prices:.....15 17 19 21
 Per doz.....\$3.25 3.75 4.25 4.75
 P. S. & W. Co.....30¢10¢40%
 Reading Hardware Co.....60%
 Sargent's Giant Grindstone.....70%
 Stowell's Giant Grindstone.....70%
 Stowell's Grindstone Fixtures, Extra
 Heavy.....50¢10¢10%
 Stowell's Grindstone Fixtures, Light.....60¢10%

Fodder Squeezers—
 See Compressors.

Forks—

NOTE.—Manufacturers are
 selling from the list of September
 1, 1904, but many jobbers are still
 using list of August 1, 1899, or
 selling at net prices.

Iowa Dig-Ezy Potato.....60¢10%
 Victor, Hay.....60¢15¢24%
 Victor, Manure.....60%
 Victor, Header.....60%
 Champion, Hay.....60%
 Champion, Header.....60%
 Champion, Manure.....60¢15¢24%
 Columbia, Hay.....60¢20%
 Columbia, Manure.....60%
 Columbia, Spading.....70¢12%
 Hawkeye Wood Barley.....60%
 W. & C. Potato Digger.....60¢10%
 Acme Hay.....60¢20%
 Acme Manure, 4 time.....60¢10¢45%
 Dakota Header.....60¢20%
 Jackson Steel Barley.....60%
 Kansas Header.....60%
 W. & C. Favorite Wood Barley.....60%
 Plated.—See Spoons.

Frames—Saw—

White, 8'x1' Bar, per doz. 75¢80¢

Red, 8'x1' Bar, per doz. \$1.00¢1.25

Red, Dbl. Brace, per doz. \$1.40¢1.50

Freezers, Ice Cream—

Qt.1 2 3 4 5
 Each.....\$1.30 \$1.60 \$1.90 \$2.20 \$2.50

Fruit and Jelly Presses—
 See Presses, Fruit and Jelly.

Fry Pans—See Pans, Fry.

Fuse—Per 1000 Feet.

Hemp.....\$2.75

Cotton.....3.20

Waterproof Spl. Taped.....3.65

Waterproof Dbl. Taped.....4.10

Waterproof Tpl. Taped.....5.35

Gates, Molasses and Oil—
 Stebbins' Pattern.....80¢10%

Gauges—

Marking, Mortise, &c.50¢10¢60%

Chapin-Stephens Co.:.....50¢10¢60%

Marking, Mortise, &c.50¢10¢60%

Schell's Patent.....50¢10¢60%

Door Hangers.....50¢10¢60%

Stanley R. & L. Co.'s Butt and
 Rabbit Gauge.....30%
 Marking and Mortise.....60%
 Wire, Brown & Sharpe's.....25%
 Wire, Morse's.....30%
 Wire, P. S. & W. Co.....35%

Gimlets—Single Cut—
 Numbered assort-
 ments, per gro.
 Nail, Metal, No. 1, \$2.00; 2, \$2.30

Spike, Metal, No. 1, \$4.00; 2, \$4.30
 Nail, Wood Handled, No. 1,
 \$2.30; 2, \$2.60
 Spike, Wood Handled, No. 1,
 \$4.30; 2, \$4.60

Glass, American Window
 See Trade Report.

Glasses, Level—

Chapin-Stephens Co.....60¢10¢10%
 Bottles or Cans, with Brush.....
 25¢10¢50%

International Glue Co. (Martin's).....40%

Grease, Axle—

Common Grade.....gro. \$1.50¢6.00

Dixon's Everlasting.....10-lb. pails, ea. 85¢

Dixon's Everlasting in boxes, 1/2 doz.
 1 lb. \$1.20; 2 lb. \$2.00

Helmet Hard Oil.....25%

Griddles, Soapstone—

Pike Mfg. Co.....33 1/2¢33 1/2¢10%

Grindstones—

Bicycle Emery Grinder.....\$6.50

Bicycle Grindstones, each.....\$2.50¢3.00

Pike Mfg. Co.:.....50%
 Improved Family Grindstones,
 per inch, 1/2 doz.....\$2.00 1/2

Pike Mower and Tool Grinder.....\$2.00

each.....\$4.00 1/2

Velox Ball Bearing, Mounted, Angle
 Iron Frames, each.....\$3.00

Grips, Nipple—

Perfect Nipple Grips.....40¢10¢2%

Halters and Ties—

Cow Ties.....60¢10¢60¢10¢45%

Covert Mfg. Co.:.....45%
 Web.....45%
 Rope.....45%
 Sial Rope.....33 1/2%
 Sial Rope.....45%
 Cotton Rope.....45%
 Hemp Rope.....45%

Covert's Saddlery Works:

Web and Leather Halters.....70%

Jute and Manila Rope Halters.....70%

Sial Rope Halters.....60¢20%

Jute, Manila and Cotton Rope
 Ties.....70%

Sial Rope Ties.....60¢10%

Onedra Community:

Am. Coil and Halters.....40¢10¢45%

Am. Cow Ties.....45¢50%

Niagara Coil and Halters.....45¢50¢45%

Niagara Cow Ties.....45¢50¢45%

E. T. Rugg & Co.:.....50%
 Leather Halters.....60%
 Web Halters and Webbing.....60%
 Jute and Sial Rope Halters.....60%
 Jute and Manila Rope and Cattle
 Ties.....60%
 Cotton Horse Ties.....60%
 Livestock Ties, Braided.....60%

Hammers—

Handled Hammers—

Heller's Machinists'.....40¢10¢40¢10%
 Heller's Farriers.....40¢10¢40¢10%
 Magnetic Tack, Nos. 1, 2, 3, 1, 25,
 1, 50, 1, 75.....50%

Peck, Stow & Wilcox, Steel.....50%

Fayette R. Plumb:

Plumb, A. E. Nail.....33 1/2¢47 1/2¢33 1/2¢40¢7 1/2%

Engineers' and B. S. Hand.....50%
 50¢7 1/2¢45¢50¢10¢7 1/2¢45%

Machinists' Hammers.....50¢10¢40¢45%

Riveting and Tappers.....40¢45¢10¢45%

Sargent's C. S. New List.....40%

Heavy Hammers and
Sledges—

Under 3 lb., per lb., 50¢.....80¢10%

3 to 5 lb., per lb., 40¢.....80¢10%

Over 5 lb., per lb., 30¢.....80¢10%

Wilkinson's Smiths'.....lb. 9¢10%

Handles—

Agricultural Tool Handles
 Axe, Pick, &c.....60¢10¢60¢10%
 Hoe, Rake, &c.....45¢50%

Fork, Shovel, Spade, &c.:.....45¢50%

Long Handles.....45¢50%

D Handles.....50¢50¢45%

Cross-Cut Saw Handles—

Atkins.....40%

Champion.....45¢45¢10%

Disston's.....50%

Mechanics' Tool Handles—

Auger, assorted.....gro. \$2.50¢3.00

Brad Acl.....gro. \$1.65¢1.75

Chisel Handles:

Apple Tanged Firmer, gro.
 assorted.....\$2.40¢2.65

Hickory Tanged Firmer, gro.
 assorted.....\$2.15¢2.40

Apple Socket Firmer, gro.
 assorted.....\$1.75¢1.95

Hickory Socket Firmer, gro.
 assorted.....\$1.45¢1.60

Hickory Socket Framing, gro.
 assorted.....\$1.60¢1.75

File, assorted.....gro. \$1.30¢1.40

Hammer, Hatchet, &c.....60¢10¢60¢10¢45%

Hand Saw, Varnished, doz.
 80¢85¢; Not Varnished, .65¢75¢

Plane Handles:

Jack, doz. 3/4; Jack, Bolted, 75¢
 Fore, doz. 45¢; Fore, Bolted, 90¢

Chapin-Stephens Co.:.....40¢40%
 Carving Tool.....40¢40%
 Chisel.....60¢65¢10%
 File and Awl.....65¢65¢10%
 Saw and Plane.....40¢40%10%
 Millers Falls Adj. and Hatchet Auger
 Handles.....15¢10%
 Nicholson Simplicity File Handle.....
 1/2 gro. \$0.85¢1.50

Hangers—

NOTE.—Barn Door Hangers are generally
 quoted per pair, without track,
 and Parlor Door Hangers per double set
 with track, &c.

Allith Mfg. Co.:.....per doz. \$5.00

Reliable, No. 1.....per doz. \$5.00

Reliable, No. 2.....per doz. \$5.00

Chicago Spring Butt Co.:.....25%

Easy Friction.....25%

Big Twin.....25%

Chisholm & Moore Mfg. Co.:.....50%

Baggage Car Door.....50%

Elevator.....50%

Railroad.....50%

Crown & Carter Mfg. Co.:.....60¢10%

Loose Axle.....60¢10%

Roller Bearing.....70%

Griffin Mfg. Co.:.....70%

Solid Axle, No. 10, \$12.00.....70%

Roller Bearing, No. 11, \$15.00, 70%
 Roller Bearing, Ex. Hy., No.
 22, \$18.00.....70%

Hinged Hangers, \$16.00.....60¢10%

Lane Bros. Co.:.....\$4.00

Parlor, Ball Bearing.....\$3.15

Parlor, Standard.....\$3.15

Parlor, No. 25.....\$2.85

Parlor, New Model.....\$2.80

Parlor, New Champion.....\$2.25

Barn Door, Standard.....60¢45%

Hinged.....net \$6.40

Covered.....60¢2%

Special.....70¢45%

Lawrence Bros.....60¢10%

Advance.....60¢10%

Cleveland.....75%

Clipper, No. 75.....60%

Crown.....60¢10%

\$2.50; Single Sets, \$1.25.....60¢45%

Giant.....70¢45%

Hummer.....70¢45%

New York.....60¢10%

Peers.....75%

Sterling.....60¢10%

McKinney Mfg. Co.:.....60¢10%

No. 1, Special, \$15.....60¢10%

No. 2, Standard, \$18.....60¢10%

Hinged Hangers, \$16.....50%

Meyers' Stayon Hangers.....60¢45%

Richards' Mfg. Co.:.....50%

Pioneer Wood Track No. 3, \$2.00
 Ball B'r'g St'l Track No. 10, \$5.00¢10%

Roller B'r'g St'l Track No. 12, \$2.15
 Roller B'r'g St'l Track No. 13, \$2.30

Hero, Adj. Track No. 19, 50¢10%

Adjustable Track, Tandem Trol-
 ley Track No. 16.....\$2.10

Seal, Steel Track No. 8.....\$2.25

Auto Adj. Track No. 22, 50¢10%

Trolley B. D. No. 17.....\$1.25

Trolley F. D. No. 120.....\$2.10

Trolley F. D. No. 121.....\$2.25

Trolley F. D. No. 150.....\$2.35

Safety Underwriters F. D. No.
 101.....\$2.75

Tandem No. 41, 2 1/2 and 3 3/4¢10%

Palace, Adjustable Track No.
 132.....50¢10%

Royal, Adjustable Track No.
 122.....50¢10%

Ives' Wood Track No. 1.....\$2.00

Trolley B. D. No. 30.....\$1.30

Trolley B. D. No. 24.....\$1.30

Trolley B. D. No. 27.....\$1.40

Trolley B. D. No. 28.....\$1.60

Roller Bearings Nos. 39, 41,
 43.....75%

Anti-Friction.....60¢20%

Hinged Tandem No. 101.....60¢45%

Folding Door B. B. Swivel No.
 135.....40%

Safety Door Hanger Co.:.....60%

Storm King Safety.....60%

U. S. Standard Hinge.....60%

Stowall Mfg. & Foundry Co.:.....40%

Acme Parlor B'l Bearing.....40%

Ajax Hinge Door.....50¢10¢45%

Atlas.....60%

Baggage Car Door.....50%

Beary Anti-Friction.....50%

Elevator.....40%

Express.....50%

Freight Car Door.....60%

Interstate.....60¢10%

Lundy Parlor Door.....50¢10%

Magic.....60%

Matches.....60¢10%

Nansen.....70¢45%

Parlor Door.....50¢10%

Railroad.....50¢10%

Wrought Iron Hinges— Strap and T Hinges, &c., List December 20, 1904:

Light Strap Hinges.....70%	
Heavy Strap Hinges.....75%	
Light T Hinges.....65%	
Heavy T Hinges.....60%	
Extra Heavy T Hinges.....70%	
Hinge Hasps.....50%	
Cor. Heavy Strap.....75%	
Cor. Es. Heavy T.....70%	
Screw Hook.....60%	
6 to 12 in. lb. 3 1/2	
12 to 20 in. lb. 3 1/2	
22 to 36 in. lb. 3 1/2	
Screw Hook and Eye.....60%	
3/4 to 1 inch.....lb. 6 1/2	
1 1/2 inch.....lb. 7 1/2	
2 inch.....lb. 8 1/2	

Hitchers, Stall— Covert Mfg. Co., Stall Hitchers.....30&2%

Hods—	Coal—	Per doz.
Inch.....	15 16 17 18	
Galv. Open.....	\$2.50 2.75 3.00 3.25	
Jap. Open.....	\$1.90 2.10 2.25 2.55	
Galv. Funnel.....	\$3.00 3.30 3.60 3.90	
Jap. Funnel.....	\$2.45 2.65 2.85 3.30	

Masons' Etc.— Cleveland Wm. Spring Co., Steel Brick, No. 12.....each \$0.95 Steel Mortar, No. 158.....each \$1.25

Hoes—

Scovill and Oval Pattern.....	60&100&60&10&10%
Grub, List Feb. 23, 1899.....	70&100&75&10%
D. & H. Scovill.....	33%

Handled— NOTE.—Manufacturers are selling from the list of September 1, 1904, but many jobbers are still using list of August 1, 1899, or selling at net prices.

Cronk's Weeding No. 1.....	\$2.00; No. 2.....\$2.25
Ft. Madison Cotton Hoe.....	70&10&10%
Ft. Madison Crescent Cultivator Hoe.....	70&10%
Ft. Madison Mattock Hoes.....	70&10%
Regular Weight.....	60&6%
Junior Size.....	50&2%
Ft. Madison Sprouting Hoe.....	50%
Ft. Madison Dixie Tobacco Hoe.....	75&10&7 1/2%
Kretzinger's Cut Easy.....	70&10%
Warren Hoes.....	45&10%
W. & C. Ivanhoe.....	33&15
R. B. 6 in. Cultivator.....	33&15
R. B. 6 1/2 in. Cultivator.....	33&15
Acme Weeding.....	50 doz. net, \$4.35
W. & C. L'ning Shuffler Hoe.....	50 doz. \$4.85

Hoisting Apparatus— See Machines, Hoisting.

Holders—

Angular, 1/2 doz. \$24.00.....	45&10%
Bardley's.....	45%
Empire.....	50%
Pullman.....	50%

File and Tool— Nicholson File Holders and File Handles.....33&40%

Fruit Jar— Triumph Fruit Jar Holder, 1/2 gross, \$10.50; 1 doz. \$1.25

Hones—Razor— Pike Mfg. Co., Belgian, German and Swaty.....50%

Hooks—Cast Iron— Bird Cage, Reading.....40% | | | |---|-----------| | Bird Cage, Sargent's List..... | 60&10% | | Celling, Sargent's List, Nos. 29, 32,
33, 123, 132, 133 and 135..... | 50&10&10% | | Clothes Line, Reading List..... | 40% | | Clothes Line, Sargent's List..... | 50&20&10% | | Coat and Hat, Sargent's List..... | 50&10% | | Clothes Line, Stowell's..... | 70% | | Coat and Hat, Reading..... | 45&20% | | Coat and Hat, Stowell's..... | 70% | | Coat and Hat, Wrightville..... | 40% | | Harness, Reading List..... | 40% | | Harness, Stowell's..... | 60% | | School House, Stowell's..... | 70% | Wire— Belt.....80&100% Wire C. & H. Hooks..... | | | |----------------------------------|--------| | 75&100&75&10&10% | | | Columbian Hdw Co., Gem..... | 70&10% | | Parker Wire Goods Co., King..... | 70&10% | | Van Wagoner, Coat and Hat..... | 70% | | Western W. G. Co. Molding..... | 75% | | Wire Goods Co..... | 60&10% | | Chief..... | 70% | | Crown..... | 75% | | Carb..... | 85% | | V Brace..... | 50&10% | | Car Harness..... | 50&10% | Wrought Iron— Box, 6 in., per doz., \$1.00; 8 in., \$1.25; 10 in., \$2.50. Cotton.....doz. \$1.05&\$1.25 Miscellaneous— Hooks, Bench, See Stops, Bench. Bush, Light, doz. \$4.75; Medium, \$5.35; Heavy, \$6.25. Grass, best, all sizes, per doz. \$1.60 Grass, common grades, all sizes, per doz. \$1.30 Whitetree.....lb. 5%&6% Hooks and Eyes— Brass.....60&50&60&10&5% | | | |--|-----------| | Malleable Iron..... | 70&70&10% | | Covert Mfg. Co. Gate and Scuttle
Hooks..... | 40% | | Covert Saddlery Works' Self Locking
Gate and Door Hook..... | 60% | | Ft. Madison Cut-Easy Corn Hooks,
1/2 doz. \$3.25 net | | Bent Hooks—See Bench Stops. Corn Hooks—See Knives, Corn. Horse Nails— See Nails, Horses. Horsehoes— See Shoes, Horses. Hose, Rubber— Garden Hose, 3/4-inch: Competition.....ft. 5 @ 6¢ 3-ply Guaranteed, ft. 8 @ 9¢ 4-ply Guaranteed, ft. 10 @ 11¢ Cotton Garden, 3/4-in., coupled: Low Grade.....ft. 8 @ 9¢ Fair Quality.....ft. 10 @ 11¢ Irons— | | | |--|-------------| | From 4 to 10.....lb. 3 @ 3 1/2¢ | | | B. B. Sad Irons.....lb. 3 1/2 @ 3 1/2¢ | | | Mrs. Potts, cents per set: | | | Nos..... | 50 55 60 65 | | Jap'd Tops..... | 68 65 78 75 | | Tin'd Tops..... | 71 68 81 78 | | New England Pressing, lb. 3 1/2 @ 4 1/2¢ | | Pinking— Pinking Irons.....doz. 60¢ Irons, Soldering See Coppers. Jacks, Wagon— Covert Mfg. Co.: Auto Screw.....30&2% | | | |-------------------------------------|----------| | Steel..... | 45% | | Covert's Saddlery Works: | | | Daisy..... | 60&10% | | Victor..... | 50% | | Lockport..... | 50% | | Lane's Steel..... | 30&10&2% | | Richards' Tiger Steel, No. 130..... | 50&10% | | Smith & Hemenway Co.'s..... | 25% | Knives— Butcher, Kitchen, &c.— Foster Bros' Butcher, &c.....30% | | | |-------------------------------------|-----------------| | Wilkinson Shear & Cutlery Co..... | 50% | | Withington Acme..... | 39 doz. \$2.65; | | Dent, \$2.75; Adj. Serrated..... | \$2.20 | | Serrated, \$2.10; Yankee No. 1..... | \$1.50 | | Yankee No. 2..... | \$1.15 | Corn— Standard List.....75&75&10% | | | |--|----------| | C. E. Jennings & Co., Nos. 45, 46, 60,
Jennings & Griffin, Nos. 41, 42..... | 60% | | Ohio Tool Co.'s..... | 70% | | Swan's..... | 75% | | Watrous..... | 16% | | L. & J. White..... | 20&5&25% | Hay and Straw— Serrated Edge, per doz. \$5.75 @ 6.00 Iwan's Sickle Edge.....doz. \$5.50 Iwan's Serrated.....doz. \$10.00 Mincing— Buffalo.....1/2 gro. \$13.00 Miscellaneous— Farriers'.....doz. \$3.00 @ 3.25 | | | |---|------------------------| | Wostenholm's..... | 1/2 doz. \$3.00 @ 3.25 | | Knobs— | | | Base, 2 1/2-inch, Birch, or Maple,
Rubber Tip..... | 1/2 gro. \$1.25 @ 1.50 | | Carriage, Jap., all sizes..... | gro. 40&45¢ | Door, Mineral.....doz. 65¢ @ 70¢ Door, Por. Jap'd.....doz. 70¢ @ 75¢ Door, Por. Nickel.....doz. \$2.05 @ 2.15 Bardley's Wood Door, Shutters, &c. 15% Picture, Sargent's.....60&10&10% Lacing, Leather— See Belting, Leather— Ladders, Store, &c.— Lane's Store.....25% | | | |--|-----| | Myers' Noiseless Store Ladders..... | 50% | | Richards Mfg. Co.:
Improved Noiseless, No. 112..... | 50% | | Climax Shelf, No. 113..... | 50% | | Trolley, No. 109..... | 50% | Ladies, Melting— L. & G. Mfg. Co. (low list).....25% Reading.....60¢ Sargent's.....50&10% Lanterns—Tubular— Regular Tubular, No. 0.....doz. \$4.25 @ 4.50 | | | |---------------------------|--------------------| | Lift Tubular, No. 0..... | doz. \$4.75 @ 5.00 | | Hinge Tubular, No. 0..... | doz. \$4.75 @ 5.00 | | Other Styles..... | 40 @ 40&5% | Bull's Eye Police— No. 1, 2 1/2-inch.....\$2.75 @ 3.00 No. 2, 3-inch.....\$3.00 @ 3.25 Lasts and Stands, Shoe— Stowell's Atlas, Malleable Iron.....50% | | | |---|---------------| | Stowell's Badger, Cast Iron..... | 50% | | Latches—Thumb—
Roggin's Latches, with screw..... | doz. 35 @ 40¢ | Door— Cronk & Carrier Mfg. Co., No. 101, 1/2 doz. \$2.90 | | | |---|--------| | Cronk & Carrier Mfg. Co., Latch,
Hasp and Staples..... | 50% | | Richards' Bull Dog, Heavy, No. 125..... | 50&5% | | Richards' Trump, No. 127..... | \$1.50 | Leaders, Cattle— Small.....doz. 50¢; large, 60¢ Covert Mfg. Co.: Cotton, Hemp and Jute, 45%; Sisal, 33%. Lifters, Transom— R. & E.....33&4% Lines— Wire Clothes, Nos. 18 19 20 100 feet.....\$2.25 2.00 1.75 75 feet.....\$1.75 1.55 1.10 Anniston Waterproof Clothes, 50 ft. 1/2 gro. \$25.00; Gilt Edge, \$25.00; Air Line, \$23.00; Acme, \$18.00; Alabama, \$17.00; Empire, \$16.00; Advance, \$14.00; Eclipse, \$13.50; Chicago, \$11.50; Standard, \$10.50; Columbia, \$9.50; Allston, \$13.50; Calhoun, \$12.00. Samson Cordage Works: Solid Braided Chalk, Nos. 0 to 3, 40% Silver Lake Braided Chalk, No. 0, \$6.00; No. 1, \$4.50; No. 2, \$7.00; No. 3, \$7.50. Masons' Lines, Shade Cord, &c., 20% White Cotton, No. 3 1/2, \$1.50; No. 4, \$2.00; No. 4 1/2, \$2.50; Colors, No. 3 1/2, \$1.75; No. 4, \$2.25; No. 4 1/2, \$2.75; Linen, No. 3 1/2, \$2.50; No. 4, \$3.50; No. 4 1/2, \$4.50. Tent and Awning Lines, No. 3, White Cotton, \$7.50; Drab Cotton, \$8.50. Clothes Lines, White Cotton: 50 ft., \$2.75; 60 ft., \$3.25; 70 ft., \$3.75; 75 ft., \$4.00; 80 ft., \$4.25; 90 ft., \$4.75; 100 ft., \$5.25. Locks—Cabinet— Cabinet Locks.....33 1/2 @ 33 1/2 & 47 1/2% Door Locks, Latches, &c.— NOTE.—Net Prices are very often made on these goods. | | | |-----------------------------------|--------| | Reading Hardware Co..... | 40% | | R. & E. Mfg. Co..... | 40% | | Sargent & Co..... | 40&10% | | Stowell's Steel Door Latches..... | 50% | Elevator— Stowell's.....30% Padlocks— Wrought Iron.....75&10&45&80&48% Net prices are general. R. & E. Mfg. Co. Wrought Steel and Brass.....75&10% Sash, &c.— Ives' Patent.....62 1/2% | | | |--|---------| | Bronze and Brass..... | 62 1/2% | | Crescent..... | 50&10% | | Iron..... | 62 1/2% | | Window Ventilating..... | 60% | | Robison Patent Ventilating Sash
Lock..... | 40% | | Wrought Bronze and Brass..... | 55% | | Wrought Steel..... | 55% | | Pullman Patent Ventilating Lock..... | 40% | Machines—Boring— Com. Up't, without Augers.....\$2.00 Com. Ang'p't, without Augers.....\$2.25 Swan's Improved.....40&10% | | | |--------------------------------|---------| | Jennings' Nos. 1 and 4..... | Angular | | Millers' Falls..... | 5.75 | | Snell's, Rice's Pat. 2.50..... | 2.75 | Corking— Reisinger Invincible Hand Power..... 1/2 doz. \$18.00 Fence— Williams' Fence Machines.....each, \$5.50 Hoisting— Moore's Anti-Friction Differential Pulley Block.....30% | | | |---|---------| | Moore's Hand Hoist, with Lock
Brake..... | 20% | | Chandler's..... | 12 1/2% | Ice Cutting— Washing— Boss Washing Machine Co.: Per doz. | | | |---------------------------------|---------| | Boss No. 1..... | \$37.00 | | Boss Rotary..... | \$34.00 | | Champion Rota Bagger No. 1..... | \$54.00 | | Standard Champion No. 1..... | \$48.00 | | Standard Perfection..... | \$36.00 | | Cint. Square Western..... | \$30.00 | | Uneda American, Round..... | \$30.00 | Mallets— Hickory.....45&50% Lignumite.....45&50% Tinners' Hickory and Apple- wood.....doz. 45&50% Mangers, Stable— Swett Iron Works.....50% Mashers, Vegetable— Western W. G. Co., Potato.....60&10% Mats, Door— Elastic Steel (W. G. Co.), new list..... | | | |---|--------| | Keystone Wire Matting Co.:
Keystone..... | 50&10% | | Ideal..... | 50% | Mattocks— See Picks and Mattocks. Milk Cans—See Cans, Milk. Mills, Coffee, &c.— Enterprise Mfg. Co.....25&30% | | | |-----------------------------------|-----------| | National list Jan. 1, 1902..... | 30% | | Parker's Columbia & Victoria..... | 50&10&60% | | Parker's Box and Side..... | 50&10&60% | | Swift, Lane Bros. Co..... | 30% | Mowers, Lawn— NOTE.—Net prices are generally quoted Cheap.....all sizes, \$1.85 @ 2.00 Cheap.....all sizes, \$2.00 @ 2.50 Better Grade.....all sizes, \$2.50 @ 4.50 | | | |---------------------------------------|-----------------------| | High Grade..... | \$4.50 4.75 5.00 5.25 | | Continental..... | 60&5% | | Great American..... | 70% | | Great American B. B.'s, new list..... | 70% | | Quaker City..... | 70% | | Pennsylvania..... | 60&5% | | Pennsylvania, Jr. Ball Bearing..... | 60% | | Pennsylvania Golf..... | 50% | | Pennsylvania Horse..... | 33&45% | | Pennsylvania Pony..... | 40&5% | Granite State: Style A, Low Wheel.....70&10&10&5% | | | |---|----------| | Style B, Low Wheel..... | 70&10&5% | | Style C, High Wheel..... | 70&10% | | Style D, High Wheel..... | 70% | | Philadelphia..... | 70&5% | | Styles M. S. C. K. T..... | 70&5% | | Style A, all Steel..... | 80&5% | | Style E, High Wheel..... | 70&10&5% | | Drexel and Gold Coin, special list..... | 50% | Nippers— See Pliers and Nippers. Nuts— Cold Punched: Off list. Mfrs. or U. S. Standard. Square, Blank or Tapped.....\$4.90 Hexagon, Blank or Tapped.....\$5.30 Square, Blank, C. & T.....\$5.20 Hexagon, Blank, C. & T.....\$5.90 Hot Pressed: Mfrs., U. S. or Nar. Gauge Stan'd. Square, Blank.....\$5.30 Hexagon, Blank.....\$5.20 Square, Tapped.....\$5.20 Hexagon, Tapped.....\$5.70 Oakum— Best.....lb. 6 1/2 @ 6 1/2¢ U. S. Navy.....lb. 5 1/2 @ 6 1/2¢ Navy.....lb. 4 1/2 @ 6 1/2¢ Plumbers' Spun Oakum.....2 1/2 @ 6 1/2¢ In carload lots 1/4 lb. off, f.o.b. New York. Oil Tanks—See Tanks, Oil. Oilers— Brass and Copper.....50&10% | | | |-------------------|----------| | Tin or Steel..... | 70&70&5% | | Zinc..... | 70&70&5% | Chase or Paragon: Brass and Copper.....50&10% | | | |--|-----------| | Tin or Steel..... | 65&10% | | Zinc..... | 65&10% | | Malleable, Hammers, Imp'd, Nos.
11, 12 and 13..... | 20% | | Malleable, Hammers' Old Pattern,
Nos. 1, 2 and 3..... | 50% | | American Tube & Stamping Co.:
Spring Bottom Cans..... | 70&70&10% | | Railroad Oilers, &c..... | 60&60&10% | Openers—Can—Per doz. Sprague, Iron Handle.....30&35¢ Sprague, Wood Handle.....35&40¢ Sardine Scissors.....\$1.75 @ \$3.00 National.....50&10% | | | |--|----------------------| | Stowell's Sprague..... | 1/2 doz. \$3.45 @ 4¢ | | Vim Tin Shear and Can Opener,
1/2 doz. 75c; per gro. \$7.50 | | Egg— Nickel Plate.....1/2 doz. \$2.00 Silver Plate.....1/2 doz. \$4.00 Packing— Asbestos Packing, Wick and Ropes.....lb. 15&20¢ Rubber (Pair quality goods.) Sheet, C. I.....11 @ 12¢ Sheet, C. O. S.....11 @ 12¢ Sheet, C. B. S.....12 @ 13¢ Sheet, Pure Gum.....40 @ 45¢ Sheet, Red.....40 @ 50¢ Jenkins' '98, 1/2 lb. 80¢.....25¢ @ 25&5% Miscellaneous— American Packing.....lb. 7 @ 10¢ Cotton Packing.....lb. 16 @ 25¢ Italian Packing.....lb. 9 @ 12 1/2¢ Jute.....lb. 4 @ 4 1/2¢ Russia Packing.....lb. 8 @ 11¢ Pails, Creamery— B. M. Co., with gauges—No. 1, \$6.25; No. 2, \$6.50 1/2 doz. Pails, Water, Well, &c.— See Buckets. Pans—Dripping— Standard List.....65&10% Common Lipped:

Improved Bay State.....	doz. \$29.00
Improved Bay State.....	doz. \$15.00
Little Star.....	doz. \$36.00
New Lightning.....	doz. \$5.00
Reading 72.....	doz. \$3.25
Reading 78.....	doz. \$6.25
Rocking Table.....	doz. \$6.25
Turn Table.....	doz. \$6.25
White Mountain.....	doz. \$5.00

Potato—

Saratoga.....	doz. \$7.00
White Mountain.....	doz. \$6.00

Picks and Mattocks—

List Feb. 23, 1899.....	75%
Cronk's Handled Garden Mattock.....	33%
doz., \$6.40.....	

Pinking Irons—

See Irons, Pinking.

Pins, Escutcheon—

Brass.....	60¢@60¢@10¢
Iron, list Nov. 11, '85.....	60¢@60¢@10¢

Pipe, Cast Iron Soil—

Carload lots.....	
Standard, 2-6 in.....	60%
Extra Heavy, 2-5 in.....	70%
Fittings.....	75%

Pipe, Merchant—

Consumers, Carloads.	
Steel.	
Blk. Gale.	Blk. Gale.
1/4 & 1/2 in.....	55% 68 1/2 52 1/2
3/4 in.....	50% 72 1/2 60 1/2
1 in.....	75% 63 72 1/2 60 1/2
1 1/4 in.....	70% 69 77 67
1 1/2 in.....	75% 69 72 66 1/2

Pipe, Vitrified Sewer—

Carload lots.	
Standard Pipe and Fittings, 2 to 24 in.	
New England.....	68%
New York and New Jersey.....	71%
Maryland, Delaware, E. Pa. 75% N. Cal. Pa. and West Va.....	77%
Virginia.....	76%
Ohio, Michigan and Ky.....	77%
Indiana.....	77%

NOTE—Carload lots are generally delivered.

Pipe, Stove—

Edwards' Nested Stove Pipe:	
C. L. L.	
5 in., per 100 joints.....	\$7.00 \$8.00
6 in., per 100 joints.....	7.50 8.50
7 in., per 100 joints.....	8.50 9.50

Planes and Plane Irons—

Wood Planes—	
Bench, first qual.....	40¢@10%
Bench, second qual.....	33 1/2¢@10%
Molding.....	33 1/2¢@10%
Adapting.....	40¢@10%
Chapin-Stephens Co.....	40¢@10%
Bench, First Quality.....	40¢@10%
Bench, Second Quality.....	33 1/2¢@10%
Molding.....	33 1/2¢@10%
Toy and German.....	40¢@10%
Chapin's.....	40¢@10%
Ohio Tool Co.....	40¢@10%
Bench, First Quality.....	40¢@10%
Bench, Second Quality.....	33 1/2¢@10%
Molding.....	33 1/2¢@10%
Adjustable Wood Bottom.....	40¢@10%
Union.....	40¢@10%

Iron Planes—

Bailey's (Stanley R. & L. Co.).....	40¢@10%
Chapin's Iron Planes.....	50¢@10%
Miscellaneous Planes (Stanley R. & L. Co.).....	35¢
Ohio Tool Co.'s Iron Planes.....	60¢
Sargent's.....	60¢@10%

Plane Irons—

Wood Bench Plane Irons—	
Buck Bros.....	30%
Chapin-Stephens Co.....	30¢@10%
Ohio Tool Co.....	30%
Stanley R. & L. Co.....	35%
Union.....	50%
L. & J. White.....	20¢@5%

Planters, Corn, Hand—

Kohler's Eclipse.....	doz. \$8.50
-----------------------	-------------

Plates—

Pellor.....	lb. 4¢@4 1/4¢
-------------	---------------

Pliers and Nippers—

Button Pliers.....	75¢@10¢@75, 10, 5%
Gas Burner, per doz.....	\$1.50, \$1.25
@ \$1.30; 6 in., \$1.45 @ 1 in.	
Gas Pipe.....	7 8 10 12 in.
Acme Nippers.....	\$2.00 \$2.25 \$3.00 \$3.75

Cronk & Carrier Mfg. Co.—

American Button.....	75¢@10%
----------------------	---------

Stub's Pattern—

Combination and others.....	33 1/2%
-----------------------------	---------

Heller's Farriers' Nippers, Pincers and Tools—

The Nettleton Mfg. Co. Reversible	40¢@10¢@40¢@10¢@10%
-----------------------------------	---------------------

Cutting Nippers—

P. S. & W. Finners' Cutting Nippers	50%
-------------------------------------	-----

Wm. Schollhorn Co.—

Bernard.....	33 1/2%
--------------	---------

Elm City.....

Lodi.....	33 1/2%
-----------	---------

Paragon.....

Swedish Side, End and Diagonal Cutting Pliers.....	50%
--	-----

Utica Drop Forge & Tool Co.—

Pliers and Nippers, all kinds.....	40%
------------------------------------	-----

Plumbs and Levels—

Chapin-Stephens Co.....	30¢@10¢@10%
-------------------------	-------------

Plumb and Levels.....

Chapin's Imp. Brass Cor. 10¢@10¢@10%	
--------------------------------------	--

Pocket Levels.....

Diston's Plumbs and Levels.....	70%
---------------------------------	-----

Diston's Pocket Levels.....

C. F. Jennings & Co.'s Iron.....	33 1/2%
----------------------------------	---------

C. F. Jennings & Co.'s Iron, Adjustable.....

Stanley R. & L. Co.....	45%
-------------------------	-----

Stanley's Duplex.....

Woods' Extension.....	33 1/2%
-----------------------	---------

Poachers, Egg—

Ruffalo Steam Egg Poachers, doz.	No. 1, \$6.00; No. 2, \$9.00; No. 3, \$9.00; No. 4, \$12.00.
----------------------------------	--

Points, Glaziers'—

Bulk and 1-lb. papers.....	lb. 0¢
1/2-lb. papers.....	lb. 9¢@10¢
1/4-lb. papers.....	lb. 9¢@11¢

Pokes, Animal—

Pt. Madison Hawkeye.....	doz. \$3.25
Pt. Madison Western.....	doz. \$4.00

Police Goods—

Manufacturers' Lists.....	25¢@25¢@5%
---------------------------	------------

Polish—Metal, Etc—

Glasbrite, No. 2, 5 lb can (powder), each, \$1.25; doz. \$12.00; No. 2, 10 lb can (cake), each, \$2.50; doz. \$24.00.	
---	--

Prestoline Liquid, No. 1 (1/2 pt.).....	40%
---	-----

Prestoline Paste.....	40%
-----------------------	-----

George Winham Hoffman.....	40%
----------------------------	-----

U. S. Metal Polish Paste, 3 oz. boxes, doz. 50¢; doz. \$4.50;	
---	--

1/2 lb boxes, doz. \$1.25; 1 lb boxes, doz. \$2.25.	
---	--

U. S. Liquid, 5 oz. cans, doz. \$1.25; doz. \$12.00.	
--	--

Barkeepers' Friend Metal Polish, doz. \$1.75; doz. \$18.00.	
---	--

Wynn's White Silk, 1/2 pt. cans, doz. \$2.00.	
---	--

Stove—

Black Eagle Benzine Paste, 5 lb cans, doz. \$1.00.	
--	--

Black Eagle, Liquid, 1/2 pt. cans, doz. \$1.00.	
---	--

Black Jack Paste, 1/2 lb cans, doz. \$1.00.	
---	--

Black Kid Paste, 5 lb cans, each, \$0.65.	
---	--

Ladd's Black Beauty Liquid, per 100 tins.....	\$6.75
---	--------

Joseph Dixon's, gr. \$5.75.....	10%
---------------------------------	-----

Firestone Plumbago.....	10%
-------------------------	-----

Firestone, Friend Metal Polish, doz. \$1.50.	
--	--

Japanese.....	gr. \$3.50
---------------	------------

Jet Black.....	gr. \$3.50
----------------	------------

Peerless Iron Enamel, 10 oz. cans, doz. \$1.50.	
---	--

Wynn's.....	
-------------	--

Black Silk, 5 lb pail.....	each 70¢
----------------------------	----------

Black Silk, 1/2 lb box.....	doz. \$1.00
-----------------------------	-------------

Black Silk, 5 oz. box.....	doz. \$0.75
----------------------------	-------------

Black Silk, 1/2 pt. liq.....	doz. \$1.00
------------------------------	-------------

Poppers, Corn—

1 qt., Square.....	gro. \$9.00
--------------------	-------------

1 qt., Round.....	gro. \$10.00
-------------------	--------------

1 1/2 qt., Square.....	gro. \$11.00
------------------------	--------------

2 qt., Square.....	gro. \$13.00
--------------------	--------------

Post Hole and Tree Augers and Diggers—

See also Diggers, Post Hole, &c.

Posts, Steel—

Steel Fence Post, each, 5 ft., 42¢;	
-------------------------------------	--

6 ft., 46¢; 6 1/2 ft., 48¢.	
-----------------------------	--

Steel Hitching Posts.....	each \$1.30
---------------------------	-------------

Potato Parers—

See Parers, Potato.

Pots, Glue—

Enamelled.....	40%
----------------	-----

Tinned.....	35%
-------------	-----

Powder—

In Canisters:	
---------------	--

Duck, 1 lb.....	each 45¢
-----------------	----------

Fine Sporting, 1 lb.....	each 75¢
--------------------------	----------

Rifle, 1/2 lb.....	each 15¢
--------------------	----------

Rifle, 1-lb.....	each 25¢
------------------	----------

In Kegs:	
----------	--

12 1/2-lb. kegs.....	\$3.50
----------------------	--------

25-lb. kegs.....	\$4.50
------------------	--------

King's Semi-Smokeless:	
------------------------	--

Keg (25 lb bulk).....	\$6.50
-----------------------	--------

Half Keg (12 1/2 lb bulk).....	\$3.50
--------------------------------	--------

Quarter Keg (6 1/2 lb bulk).....	\$1.90
----------------------------------	--------

Case 24 (1 lb cans bulk).....	\$8.50
-------------------------------	--------

Half case (1 lb cans bulk).....	\$4.50
---------------------------------	--------

King's Smokeless: Shot Gun, Rifle.	
------------------------------------	--

Keg (25 lb bulk).....	\$12.00 \$15.00
-----------------------	-----------------

Half Keg (12 1/2 lb bulk).....	6.25 7.75
--------------------------------	-----------

Quarter Keg (6 1/2 lb bulk).....	3.25 4.00
----------------------------------	-----------

Case 24 (1 lb cans bulk).....	14.00 17.00
-------------------------------	-------------

Half case (1 lb cans bulk).....	7.25 8.75
---------------------------------	-----------

Robin Hood Sm'less Shot Gun.....	50¢@20%
----------------------------------	---------

Presses—

Fruit and Jelly—	
------------------	--

Enterprise Mfg. Co.....	20¢@25%
-------------------------	---------

Seal Presses—

Morrill's No. 1, doz. \$20.00.....	50%
------------------------------------	-----

Pruning Hooks and Shears See Shears.**Pullers, Cork—**

Invincible Cork Puller.....	\$21.00
-----------------------------	---------

Pullers, Nail—

Cyclops.....	50%
--------------	-----

Miller's Falls, No. 3, doz. \$12.00.....	33 1/2¢@10%
--	-------------

Morrill's No. 1, Nail Puller, doz. \$20.00.....	50%
---	-----

Pearson No. 1, Cyclone Spike Puller, each \$50.00.....	50%
--	-----

Scranton, Case Lots.....	50%
--------------------------	-----

No. 2B (large).....	\$5.50
---------------------	--------

No. 3B (small).....	\$5.00
---------------------	--------

Smith & Hemenway Co.: Diamond B. No. 2, case lots.....	doz. \$6.00
--	-------------

Diamond B. No. 3, case lots.....	doz. \$5.50
----------------------------------	-------------

Giant No. 1, doz. \$13; No. 2, \$14.50; No. 3, \$15.....	33 1/2%
--	---------

Staple Pullers.....	60%
---------------------	-----

Parrot Tack and Stub Puller, doz. \$5.....	75¢; gr. \$6.00
--	-----------------

Pulleys, Single Wheel—

Inch.....	1 1/4 1 1/2 2 3
-----------	-----------------

Awning or Tackle.....	doz. \$0.30 .15 .60 1.05
-----------------------	--------------------------

Hay Fork, Swivel or Solid Eye.....	doz., 4 in., \$1.25; 5 in., \$1.55
------------------------------------	------------------------------------

Inch.....	2 1/4 2 1/2 3
-----------	---------------

Hot House, doz.....	\$0.85 .85 1.90
---------------------	-----------------

Screw, doz.....	\$0.16 .16 .23 .30
-----------------	--------------------

Inch.....	1 1/4 1 1/2 2 3
-----------	-----------------

Side, doz.....	\$0.25 .25 .55 .60
----------------	--------------------

Inch.....	1 1/4 1 1/2 2 3
-----------	-----------------

Stowell's:	
------------	--

Ceiling or End, Anti-Friction.....	60¢@10%
------------------------------------	---------

Thumb Writer, Anti-Friction.....	60¢@10%
----------------------------------	---------

Electric Light.....	60%
---------------------	-----

Side, Anti-Friction.....	60¢@10%
--------------------------	---------

Sash Pulleys—

Common Frame; Square or Round End, per doz, 1 1/2 and 2 in.....	16¢@19¢
---	---------

Rulers, Desk—	
Impson & Son:	
Boxwood and Maple.....	30&10%
Rules	
10" 10000.....	60&10&10%
10" 10000.....	35&10&35&10&5%
Chapin-Stephens Co.:	
Boxwood.....	60&60&10%
Flexfold.....	27&10&10&10&2%
Ivory.....	35&35&10&10%
Miscellaneous.....	50&50&10&10%
Combination.....	55&55&10%
Stationers'.....	10&10&10%
Kouff & Esser Co.:	
Folding, Wood.....	35&10%
Folding, Steel.....	33&10%
Larkin's Steel.....	50&10%
Larkin's Lumber.....	60%
Stanley R. & L. Co.:	
Boxwood.....	62%
Ivory.....	45%
Miscellaneous.....	60%
Zig Zag.....	40%
Zig Zag, Pin Joint.....	42%
Ivory Nut Co.:	
Boxwood.....	60&60&10%
Ivory.....	35&10&35&10&10%

Sash Balances—

See Balance, Sash.

Sash Locks—

See Locks, Sash.

Sash Weights—

See Weights, Sash.

Sausage Stuffers or Fillers

See Stuffers or Fillers, Sausage.

Saw Frames—

See Frames, Saw.

Saw Sets—See Sets, Saw.

Saw Tools—See Tools, Saw.

Saws—	
Atkins':	
Circular.....	50%
Band.....	30&10&99%
Cross Cut.....	35&5%
Mulay, Mill and Drag.....	50%
One-Man Saw.....	40%
Wood Saw.....	40%
Hand, Compass, &c.....	40%
Chapin-Stephens Co.:	
Turning Saws and Frames.....	30&30&10%
Diamond Saw & Stamping Works:	
Sterling Kitchen Saws.....	30&10&10%
Disston's:	
Circular, Solid and Ins'ted Tooth.....	50%
Band, 2 to 14 in. wide.....	60%
Band, 1/4 to 1 1/2.....	60%
Crosscut.....	50%
Narrow Crosscut.....	55%
Mulay, Mill and Drag.....	50%
Framed Woodsaws.....	35%
Woodsaw Blades.....	35%
Woodsaw Rods.....	35%
Hand Saws, Nos. 12, 9, 9, 16, 18, 12, 7, 8.....	25%
Hand Saws, Nos. 7, 10, 10 1/2, 3, 1, 0, 0, Combination.....	30%
Compass, Key Hole, &c.....	25%
Butcher Saws and Blades.....	35%
C. E. Jennings & Co.'s:	
Back Saws.....	25%
Butcher Saws.....	30%
Compass and Key Hole Saws.....	35&5%
Framed Wood Saws.....	30%
Hand Saws.....	20&2%
Wood Saw Blades.....	35%
Millers Falls:	
Butcher Saws.....	15&10%
Star Saw Blades.....	15&10%
Peace & Richardson's Hand Saws.....	30%
Simonds':	
Circular Ground.....	50%
Crescent Ground Cross Cut Saws.....	35%
One-Man Cross Cut.....	40&10%
Lang Mill, Mulay and Drag Saws.....	50%
Band Saws.....	50%
Back Saws.....	25&2&7%
Butcher Saws.....	35&5&7%
Hand Saws.....	25&2&7%
Hand Saws, Bay State Brand.....	42%
Compass, Key Hole, &c.....	25&2&7%
Wood Saws.....	35&5&7%
Springfield Mach. Screw Co.:	
Diamond Kitchen Saws.....	40&10&50%
Butcher Saws and Blades.....	35&40%
Wheeler, Madden & Clemson Mfg. Co.'s Cross Cut.....	50%

Hack Saws—	
Atkins' Hack Saw Blades A A A.....	35%
Disston's:	
Concave Blades.....	25%
Keystone.....	40%
Hack Saw Frames.....	40%
Fitchburg File Works, The Best.....	35%
C. E. Jennings & Co.:	
Hack Saw Frames, Nos. 175, 180.....	40&7%
Hack Saw, Nos. 175, 180, complete.....	40&7%
Goodell's Hack Saw Blades.....	40%
Griffin's Hack Saw Frames.....	35&5&10%
Griffin's Hack Saw Blades.....	35&5&10%
Springfield Mach. Screw Co.:	
Diamond Hack Saw Blades.....	35%
Diamond Hack Saw Frames.....	50%
Star Hack Saws and Blades.....	15&10%
Sterling Hack Saw Blades.....	30&10&5%
Sterling Hack Saw Frames.....	30&10&10%
Sterling Power Hack Saw Machines, each, No. 1, \$25.00; No. 2, \$30.00.....	10%
Victor Hack Saw Blades.....	40&7%
Victor Hack Saw Frames.....	40%

Scalers, Fish—	
Covert's Saddlery Works.....	60&10%
Scales—	
Family, Turnbills.....	50&50&10%
Counter:	
Hatch, Platform, 1/4 oz. to 1 lb.....	30&50
Two Platforms, 1/4 oz. to 8 lbs.....	30&50
Union Platform, Plain.....	1.70&1.90
Union Platform, Stpd.....	1.85&2.15
Chattillon's:	
Eureka.....	25%

Favorite	40%
Crocker's Trip Scales.....	50%
Chicago Scale Co.:	
The "Little Detective".....	25 50
Union or Family No. 2.....	60%
Portable Platform (reduced list).....	50%
Wagon or Stock (reduced list).....	25&35%
The Standard "R. K. and Wagon".....	50%

Scrapers—	
Box, 1 Handle.....	20&22
Box, 2 Handle.....	22&25
Ship.....	22&25
Adjustable Box Scraper (S. R. & L. Co.), \$6.00.....	15%
Chapin-Stephens Co., Box.....	30&30&10&10%

Screens, Window and Frames—	
Maine Screen Frames.....	40&10&5%
See also Doors.	

Screws—Bench and Hand	
Bench, Iron, doz., 1 in., \$2.50.....	
2 1/2, 1 1/2, \$3.00; 3 1/2, 1 1/2, \$3.50.....	
Bench, W'd, Bench, doz. 30&30&5%	
Hand, Wood.....	30&30&5%
R. Bliss Mfg. Co., Hand.....	30&30&10%
Chapin-Stephens Co., Hand.....	30&30&10%
Ohio Tool Co., Bench and Hand.....	30%
Coach, Lag and Hand Rail—	
Lag, Cone Point, list Oct. 1, '99.....	75&15%
Coach, Gimlet Point, list Oct. 1, '99.....	75&10%
Hand Rail, list Jan. 1, '91.....	70&10&75%

Jack Screws	
Standard List.....	80&80&5%
Millers Falls.....	50&10&10%
Millers Falls, Roller.....	50&10%
P. S. & W.....	50%
Sargent.....	70&10%
Swett Iron Works.....	75&10&80&5%

Machine—	
List Jan. 1, '98:	
Flat or Round Head, Iron.....	50&50&10%
Flat or Round Head, Brass.....	50&50&10%

Set and Cap—	
Set (Iron).....	80%
Set (Steel), net advance over Iron.....	25%
Sq. Hd. Cap.....	75%
Hx. Hd. Cap.....	75%
Rd. Hd. Cap.....	60&10%
Fillister Hd. Cap.....	60&10&10%

Wood—	
List July 23, 1905:	
Flat Head, Iron.....	87&10&10%
Round Head, Iron.....	85&10&10%
Flat Head, Brass.....	85&10&10%
Round Head, Brass.....	80&10&10%
Flat Head, Bronze.....	77&10&10%
Round Head, Bronze.....	75&10&10%
Drive Screws.....	87&10&10%

Scroll Saws—	
See Saws, Scroll.	

Scythes—	
Grass, No. 1, Plain Finish.....	\$6.25
Clipper, Bronzed Webb.....	\$6.50
No. 3 Clipper, Pol'd Webb.....	\$6.75
No. 6 Clipper & Solid Steel.....	\$7.00
Bush, Weed & Bramble, No. 2.....	\$36.50
Grain, No. 1.....	\$8.25
Bronzed Webb, No. 1.....	\$8.50
Nos. 3 & 4 Clipper, Grain.....	\$8.75
Solid Steel No. 6.....	\$9.25

Seeders, Raisin—	
Enterprise.....	25&30%
Sets—Awl and Tool—	
Aiken's Sets, Awl and Tools:	
No. 20, 30 doz., \$10.00.....	60&10%
Fray's Adj. Tool Handles, No. 1, \$12.....	50%
2, \$18; 3, \$12; 4, \$9; 5, \$7.....	50%
C. E. Jennings & Co.'s Model Tool Holders.....	30%
Millers Falls Adj. Tool Handles, No. 1, \$12; No. 4, \$12; No. 5, \$18.....	15&10%

Garden Tool Sets	
Ft. Madison Three Flow, Hoe, Rake and Shovel.....	30 doz sets \$9.00
Sets, Nail—	
Octagon.....	gro. \$3.50 @ 3.75
Buck Bros.....	27%
Cannon's Diamond Point.....	gro. \$12.40
Mayhew's.....	gro. \$9.00
Snell's Corrugated, Cup Pt.....	gro. \$7.20
Snell's Knurled, Cup Pt.....	gro. \$7.20
Springfield Mach. Screw Co.:	
Diamond Knurled Cup Pt.....	gro. \$7.50

Rivet—	
Regular list.....	75&75&10%
Saw—	
Aiken's:	
Genuine.....	50&10%
Imitation.....	50&10%
Atkin's:	
Criterion.....	40%
Adjustable.....	40%
Bemis & Call Co.'s:	
Cross Cut.....	30%
Plate.....	20%
Disston's Star and Monarch.....	25%
Morris's No. 1, \$15.00.....	50%
Nos. 3 and 4, Cross Cut, \$20.00.....	50%
No. 5, Mill, \$30.00.....	50%
Nos. 10, 11, 95, \$15.00.....	50%
No. 1 Old Style, \$10.00.....	50%
Special, \$16.25.....	50%
Royal Royal Cross Cut.....	gro. \$8.00
Royal Hand.....	gro. \$4.50
Taintor Positive.....	gro. \$6.75

Shaving	
Fox Shaving Sets, No. 30.....	gro. net, \$24.00
Smith & Hemenway Co.:	
Sharpeners, Knife—	
Chicago Wheel & Mfg. Co.....	70%
Pike Mfg. Co.:	
Fast Cut Pocket Knife Hones.....	1.50
Mounted Kitchen Sand Stone.....	1.50
Natural, Grit Carving Knife.....	3.00
Hones, 30 doz.....	3.00
Quick Cut Emery Carving Knife Hones.....	1.50
Quick Edge Pocket Knife Hones.....	2.50

Skate—	
Smith & Hemenway Co.....	20%
Shaves, Spoke—	
Iron.....	doz. \$1.10 @ 1.25
Wood.....	doz. \$1.75 @ 2.25
Bailey's (Stanley R. & L. Co.).....	45%
Razor Edge (Stanley R. & L. Co.).....	35%
Chapin-Stephens Co.....	30&30&10&10%
Goodell's.....	doz. \$2.00 @ 1.50
Wood's F1 and F2.....	50%

Shears—	
Cast Iron.....	7 8 9 in.
Best.....	\$16.00 18.00 20.00 gro.
Good.....	\$13.00 15.00 17.00 gro.
Cheap.....	\$5.00 6.00 7.00 gro.
Straight Trimmers, &c.	
Best quality, Jap.....	70&70&10%
Best quality, Nickel.....	60&60&10%
Fair quality, Jap.....	80&80&5%
Fair quality, Nickel.....	75&75&10%
Tailors' Shears.....	40&40&10%
Acme Cast Shears.....	40&40&10%
Hemish's Tailors' Shears.....	40&40&10%
Wilkinson's Sheep, 1900 list.....	50&10%

Tinners' Snips—	
Steel Blades.....	20&50&20&10%
Steel Laid Blades.....	40&40&50%
Forged Handles, Steel Blades, Berlin.....	50&50&5%
Heinrich's Snips.....	40%
Jennings & Griffin Mfg. Co.'s, 6 1/2 in.....	50%
Niagara Snips.....	40%
P. S. & W. Forged Handles.....	20%

Pruning Shears—	
Cronk's Hand Shears.....	33%
Cronk's Wood Handle Shears.....	33%
Disston's Combined Pruning Hook and Saw, 1/2 doz. \$18.00.....	25%
Disston's Pruning Hook, 1/2 doz.....	25%
John T. Henry Mfg. Co.:	
Pruning Shears, all grades.....	50&10%
P. S. & W. Co.....	33%
Wilkinson's Hedge, 1900 list.....	50&10%
Wilkinson's Lawn and Border.....	50%

Sheaves—Sliding Door—	
Stowell's Anti-Friction.....	50%
Patent Roller, Hatfield's, Sargent's list.....	70&10%
Reading list.....	33%
R. & E. list.....	33%
Sargent's list.....	10&10%

Sliding Shutter—	
Reading list.....	40%
R. & E. list.....	33%
Sargent's list.....	10&10%
Shells—Shells, Empty—	
Brass Shells, Empty:	
Climax, Club, Rival, 10 and 12 gauge.....	65&5%
Paper Shells, Empty:	
Acme, Ideal, Leader, New Rapid, Magic, 10, 12, 16 and 20 gauge.....	25&5%
Blue Rival, New Climax, Challenge, Monarch, Defiance, Repeater, Yellow Rival, 10, 12, 16 and 20 gauge.....	20%
Climax Union, League, New Rival, 10 and 12 gauge.....	25%
Climax Union, League, New Rival, 14, 16 and 20 gauge.....	20%
Expert, Metal Lined and Pigeon, 10, 12, 16 and 20 gauge.....	33%
Robin Hood, Low Brass.....	20&5%
Robin Hood, High Brass.....	30&5%

Shells, Loaded	
Loaded with Black Powder.....	40%
Loaded with Smokeless Powder, medium grade.....	40&5%
Loaded with Smokeless Powder, high grade.....	40&10&10%
Robin Hood Smokeless Powder:	
Robin Hood, Low Brass.....	50%
Comets, High Brass.....	50&10&5%

Shoes, Horse, Mule, &c.—	
F. O. B. Pittsburgh:	
Iron.....	per keg \$4.00
Steel.....	per keg \$3.75
Burden's, all sizes.....	per keg \$3.90

Shot—	
Drop, up to B, 25-lb. bag.....	\$1.80
Drop, B and larger.....	per 25-lb. bag, \$2.05
Buck, 25-lb. bag.....	\$2.05
Chilled, 25-lb. bag.....	\$2.05

Shovels and Spades—	
Association List, Nov. 15, 1902.....	40%
Snow Shovels—	
Long Handle.....	\$2.75 @ \$3.00
Wood and Mail, D. Handle.....	\$3.25 @ \$3.50

Sieves and Sifters—	
Hunter's Imitation.....	gro. \$9.50 @ 10.00
Hunter's Genuine.....	per gro. \$12.00 @ 12.50
Buffalo Metallic Blue, R. M. Co., 1/2 gr. 14&16 16&18 18&20.....	\$13.20 \$13.50 \$14.40
Shaker (Barler's Pat.) Flour Sifters.....	\$2.00

Sieves, Seamless Metallic—	
Per dozen:	
Mesh.....	14 16 18 20
Iron Wire.....	\$1.05 1.05 1.10 1.20
Tinned Wire.....	\$1.15 1.15 1.20 1.30
Nested, 10, 11 and 12 Inch.....	
Mesh 10, Nested.....	doz. \$0.90 @ 0.95
Mesh 20, Nested.....	doz. \$1.00 @ 1.05
Mesh 24, Nested.....	doz. \$1.30 @ 1.40

Sinks, Cast Iron—	
Painted, Standard list:	
12 x 12 to 22 x 36 in.....	60&5%
20 x 40 to 24 x 50 in.....	55%
24 x 60 to 24 x 120 in.....	35%
Barnes' low list:	
20 x 40 to 24 x 36 in.....	60%
20 x 40 to 24 x 50 in.....	55%
NOTE.—There is not entire uniformity in lists used by jobbers.	

Skels, Wagon—	
Cast Iron.....	80&80&10%
Steel.....	40&40&10%
Slates, School—	
Factory Shipments.	
"D" Slates.....	50&50&10%

Eureka, Unexcelled Noiseless..

60&5 tens

Victor A, Noiseless. 60&5 tens & 45%

Slaw Cutters—See Cutters.

Snaps, Harness—

German.....

Covert Mfg. Co.:

Derby.....

High Grade.....

Jockey.....

Trojan.....

Yankee.....

Yankee Roller.....

Hindustan No. 1, R'g'lar. 10 lb. 10¢	
Hindustan No. 1, Small. 10 lb. 10¢	
Axe Stones (all kinds).....	2¢
Turkey Oil Stones, Extra. 5 to 10 in.....	10¢
Queer Creek Stones, 4 to 10 in.....	10¢
Queer Creek Slips.....	10¢
Sand Stone.....	10¢

Scythe Stones—	
Chicago Wheel & Mfg. Co.: Gem Corundum, 10 in., \$8.00	
Less than gross lots.....	gro. \$9.00
One gross or more.....	gro. \$7.20
Lots of 10 gross or more.....	gro. \$6.00

Pike Mfg. Co., 1901 list:	
Black Diamond S. S. 8 in. gro. \$12.00	
Lamelle S. S. 8 in. gro. \$11.00	
White Mountain S. S. 8 in. gro. \$9.00	
Green Mountain S. S. 8 in. gro. \$8.00	
Extra Indian Pond S. S. 8 in. gro. \$7.50	
No. 1 Indian Pond S. S. 8 in. gro. \$7.00	
No. 2 Indian Pond S. S. 8 in. gro. \$6.50	
Leader Red End S. S. 8 in. gro. \$4.50	
Quick Cut Emery.....	gro. \$10.00
Pure Corundum.....	gro. \$10.00
Crescent.....	gro. \$7.00
Emery Scythe Rifles, 2 Coat, 88	
Emery Scythe Rifles, 3 Coat, 88	
Emery Scythe Rifles, 4 Coat, 88	
Balance of 1904 list 33 1/2%	

Stoppers, Bottle—	
Victor Bottle Stoppers.....	gro. \$9.00

Stops—Bench—	
Millers Falls.....	15¢
Morrill's, No. 1, 10 in. 10¢	
Morrill's, No. 2, 12 in. 10¢	

Door—	
Chapin-Stephens Co.....	60¢

Plane—	
Chapin-Stephens Co.....	20¢

Straps—Box—	
Cary's Universal, case lots.....	25¢

Hame—	
Covert's Saddlery Works.....	60¢

Stretchers, Carpet—	
Cast Iron, Steel Points, doz.	60¢

Socket.....	doz. \$1.00
--------------------	-------------

Excelsior Stretcher and Tack Hammer Combined, doz.	\$6.00
--	--------

Strops, Razor—	
Star Diagonal Strop.....	25¢

Stuffers, Sausage—	
Enterprise Mfg. Co.....	25¢

National Specialty Co., list Jan. 1, 1902.....	30¢
--	-----

Sweepers, Carpet—	
National Sweeper Co.: Louis XV, Roller Bearing, Gold Plated.....	\$12.00

Hepplewhite, Roller Bearing, Silver Plated.....	\$7.00
---	--------

Sheraton, Roller Bearing, N'kel.....	\$6.00
--------------------------------------	--------

Ye Mission, Roller Bearing, Oxidized Copper.....	\$3.00
--	--------

Transparent, Roller Bearing, Plate Glass top, Nickel.....	\$3.00
---	--------

National Queen, Roller Bearing, Fancy Veneers.....	\$2.00
--	--------

Loyal, Roller Bearing, Veneers, Nickel.....	\$2.00
---	--------

Triple Medal, Roller Bearing, Nickel.....	\$2.00
---	--------

Marion, Roller Bearing, N'kel.....	\$2.00
------------------------------------	--------

Marion Queen, Roller Bearing, Nickel.....	\$2.00
---	--------

Monarch, Roller Bearing, N'kel.....	\$2.00
-------------------------------------	--------

Monarch, Roller Bearing, Jap.....	\$2.00
-----------------------------------	--------

Perpetual, Regular B'r's, N'kel.....	\$2.00
--------------------------------------	--------

Perpetual, Regular B'r's, Jap.....	\$2.00
------------------------------------	--------

Monarch Extra (17 in. case), Roller Bearing, Nickel.....	\$3.00
--	--------

Monarch Extra (17 in. case), Roller Bearing, Japanned.....	\$3.00
--	--------

Auditorium (30 in. case), Roller Bearing, Nickel.....	\$4.00
---	--------

Mammoth (30 in. case), Roller Bearing, Nickel.....	\$6.00
--	--------

NOTE—Rebates: 50¢ per dozen on three dozen lots; \$1 per dozen on five dozen lots; \$2 per dozen on ten dozen lots; \$3.50 per dozen on twenty-five dozen lots.	
--	--

Streator Metal Stamping Co.:	
-------------------------------------	--

Model E, Sanitaire.....	doz \$25.00
-------------------------	-------------

Model A, Sterling.....	doz \$25.00
------------------------	-------------

Model B, Sterling, Nickel.....	doz \$25.00
--------------------------------	-------------

Model B, Sterling, Japanned.....	doz \$25.00
----------------------------------	-------------

Model C, Sterling.....	doz \$25.00
------------------------	-------------

Model D, Sterling.....	doz \$25.00
------------------------	-------------

Tacks, Finishing Nails, &c.	
--	--

New List, May 1, 1905.	
-------------------------------	--

American Carpet Tacks.....	90¢
----------------------------	-----

American Cut Tacks.....	90¢
-------------------------	-----

Suedes Cut Tacks.....	90¢
-----------------------	-----

Suedes Upholsterers' Tacks.....	90¢
---------------------------------	-----

Gimp Tacks.....	90¢
-----------------	-----

Lace Tacks.....	90¢
-----------------	-----

Trimmers' Tacks.....	90¢
----------------------	-----

Looking Glass Tacks.....	65¢
--------------------------	-----

Bill Posters' and Railroad Tacks.....	90¢
---------------------------------------	-----

Hungarian Nails.....	85¢
----------------------	-----

Finishing Nails.....	70¢
----------------------	-----

Trunk and Clout Nails.....	80¢
----------------------------	-----

NOTE—The above prices are for Standard Weights. An extra 5% is given on Medium Weights, and an extra 10% is given on light weights.	
--	--

Miscellaneous—	
-----------------------	--

Double Pointed Tacks.....	90¢
---------------------------	-----

Steel Wire Brads, R. & E. Mfg. Co.'s list.....	50¢
--	-----

Tanks, Oil—	
--------------------	--

Emerald, R. M. Co.....	30-gal. \$3.50
------------------------	----------------

Emerald, R. M. Co.....	60-gal. \$4.25
------------------------	----------------

Queen City, R. M. Co.....	30-gal. \$3.65
---------------------------	----------------

Queen City, R. M. Co.....	60-gal. \$4.50
---------------------------	----------------

Tapes, Measuring—	
--------------------------	--

American Asses' Skin.....	50¢
---------------------------	-----

Patent Leather.....	25¢
---------------------	-----

Steel.....	33¢
------------	-----

Chesterman's.....	25¢
-------------------	-----

Eddy Asses' Skin.....	40¢
Eddy Patent Leather.....	25¢
Eddy Steel.....	40¢
Keuffel & Esser Co.: Favorite, Ass Skin.....	40¢
Favorite, Duck and Leather.....	25¢
Metallic and Steel, lower list.....	35¢

Pocket.....	35¢
Lufkin's: Asses' Skin.....	40¢
Metallic.....	30¢
Patent Bend, Leather.....	25¢
Pocket.....	40¢
Steel.....	33¢

Teeth, Harrow—	
-----------------------	--

Steel Harrow Teeth, plain or headed, 5/8-inch and larger.....	per 100 lbs. \$2.75 to \$3.00
---	-------------------------------

Thermometers—	
----------------------	--

Tin Case.....	80¢
---------------	-----

Ties, Bale—Steel Wire—	
-------------------------------	--

Single Loop.....	80¢
------------------	-----

Monitor, Cross Head, etc.....	70¢
-------------------------------	-----

Brick Tiles—	
---------------------	--

Niagara Brick Tiles.....	50¢
--------------------------	-----

Tinners' Shears, &c.—	
----------------------------------	--

See Shears, Tinners', &c.	
---------------------------	--

Tinware—	
-----------------	--

Stamped, Japanned and Pieced, sold very generally at net prices.	
--	--

Tips, Safety Pole—	
---------------------------	--

Covert's Saddlery Works.....	60¢
------------------------------	-----

Tire Benders, Upsetters, &c.—	
--	--

See Benders and Upsetters, Tire Tools—Coopers'—	
---	--

L. & I. J. White.....	20¢
-----------------------	-----

Hay—	
-------------	--

Myers' Hay Tools.....	50¢
-----------------------	-----

Stowell's Hay Carriers.....	50¢
-----------------------------	-----

Stowell's Hay Forks.....	50¢
--------------------------	-----

Stowell's Fork Pulleys.....	50¢
-----------------------------	-----

Miniature—	
-------------------	--

Smith & Hemenway Co. S.....	55¢
-----------------------------	-----

Saw—	
-------------	--

Atkins' Cross Cut Saw Tools.....	40¢
----------------------------------	-----

Simonds' Improved.....	35¢
------------------------	-----

Simonds' Crescent.....	25¢
------------------------	-----

Ship—	
--------------	--

L. & I. J. White.....	25¢
-----------------------	-----

Transom Lifters—	
-------------------------	--

See Lifters, Transom.	
-----------------------	--

Traps—Fly—	
-------------------	--

Balloon, Globe or Acme, doz.	\$1.15 to \$1.25
------------------------------	------------------

Harper, Champion or Paragon, doz. \$1.25 to \$1.40; gro. \$13.00 to \$15.50	
---	--

Game—	
--------------	--

Imitation Oneida.....	75¢
-----------------------	-----

Newhouse.....	40¢
---------------	-----

Hayley & Norton.....	65¢
----------------------	-----

Victor.....	70¢
-------------	-----

Oneida Community Jump.....	50¢
----------------------------	-----

Mouse and Rat—	
-----------------------	--

Mouse, Wood, Choker, doz. holes	85¢
---------------------------------	-----

Mouse, Round or Square Wire, doz. 85¢ to 90¢	
--	--

Marty French Rat and Mouse Traps (Genuine): No. 1, Rat, each \$1.21; doz. \$13.25	
--	--

No. 3, Rat, doz. \$6.50; case of 50 doz. \$5.75	
---	--

No. 3 1/2, Rat, doz. \$5.25; case of 72 doz. \$4.70	
---	--

No. 4, Mouse, doz. \$3.50; case of 150 doz. \$3.00	
--	--

No. 5, Mouse, doz. \$3.00; case of 150 doz. \$2.25	
--	--

Trimmers, Spoke—	
-------------------------	--

Wood's E. I.....	50¢
------------------	-----

Trowels—	
-----------------	--

Diaston Brick and Pointing.....	30¢
---------------------------------	-----

Diaston Plastering.....	25¢
-------------------------	-----

Diaston "Standard Brand" and Garden Trowels.....	35¢
--	-----

Kohler's Steel Garden Trowels, 5 in. gro. \$4.80	
--	--

Kohler's Steel Garden Trowels, 6 in. gro. \$6.00	
--	--

Never-Break Steel Garden Trowels.....	gro. \$6.00
---------------------------------------	-------------

Rose Brick and Plastering.....	25¢
--------------------------------	-----

Woodrough & McParlin, Plastering.....	25¢
---------------------------------------	-----

Trucks, Warehouse, &c.—	
------------------------------------	--

B. & L. Block Co.: New York Pattern.....	50¢
---	-----

Western Pattern.....	40¢
----------------------	-----

Handy Trucks.....	30¢
-------------------	-----

Grocery.....	doz. \$15.00
--------------	--------------

Daisy Stove Trucks, Improved Pattern.....	doz. \$18.50
---	--------------

McKinney Trucks.....	each \$10.00
----------------------	--------------

Model Stove Trucks.....	doz. \$18.50
-------------------------	--------------

Tubs, Wash—No. 1 2 3	
-----------------------------	--

Galvanized, per doz. \$4.25 4.75 5.25	
---------------------------------------	--

Galvanized Wash Tubs (R. M. Co.): No. 1 2 3	
--	--

Per doz., net. \$5.75 6.30 7.20 8.10	
--------------------------------------	--

Twine, Miscellaneous—	
------------------------------	--

Flax Twine:	
--------------------	--

No. 9, 1/4 and 1/2-lb. Balls, 22¢ to 24¢	
--	--

No. 12, 1/4 and 1/2-lb. Balls, 18¢ to 20¢	
---	--

No. 18, 1/4 and 1/2-lb. Balls, 16¢ to 18¢	
---	--

No. 24, 1/4 and 1/2-lb. Balls, 16¢ to 18¢	
---	--

No. 36, 1/4 and 1/2-lb. Balls, 15¢ to 17¢	
---	--

Chalk Line, Cotton 1/2-lb. Balls.....	25¢
---------------------------------------	-----

Cotton Mops, 6, 9, 12 and 15 lb. to doz.....	10¢
--	-----

Cotton Wrapping, 5 Balls to lb., according to quality.....	14¢
--	-----

American 2-Ply Hemp, 1/4 and 1/2-lb. Balls.....	13¢
---	-----

American 3-Ply Hemp, 1-lb. Balls.....	13¢
---------------------------------------	-----

India 2-Ply Hemp, 1/4 and 1/2-lb. Balls (Spring Twine).....	9¢
---	----

India 3-Ply Hemp, 1-lb. Balls.....	9¢
------------------------------------	----

India 3-Ply Hemp, 1 1/2-lb. Balls.....	7¢
--	----

2, 3, 4 and 5-Ply Jute, 1/2-lb. Balls.....	9¢
--	----

Mason Line, Linen, 1/2-lb. Bls. 4¢	
------------------------------------	--

No. 254 Mattress,
